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Hands On Learning
with Reading Museum Service

WOOL G48



Wool is animal fur that can be spun into thread and woven into cloth. We mainly use the fur from sheep, but it can also be gathered from some other animals such as goats, llamas and rabbits.

Not all fur bearing animals produce material that can be spun and woven. For example, the hair from human beings can not be used in this way. Wool has two qualities that distinguish it from material such as human hair - it has scales which overlap like tiles on a roof and it is crimped and fuzzy. The scales help the individual fibres to bind together. The crimp gives the wool bulk so that it can retain air. This enables wool cloth to insulate you from the heat in warm climates and from the chill in cold ones.



For the last century man-made material such as nylon or rayon have been used to make wool or have been mixed with natural wool. In more recent years other materials have also been developed as wool substitutes, bamboo for example. Nevertheless natural wool has continued to be widely used for making clothes and carpets - and has even found some modern uses such as housing insulation.

Most of the wool samples in this box are from sheep. It is generally believed that domestic sheep were bred from an animal called the mouflon (right), perhaps as long ago as six thousand years. The mouflon is a mountain dwelling creature that can still be found in the wild in western Asia and the Mediterranean islands of Corsica, Cyprus and Sardinia.



Reading Borough Council

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WOOL SAMPLES

1 & 2 Cashmere



Cashmere wool is noted for its long and luxuriously soft fibres. It is sometimes called pashmina. Cashmere wool was originally obtained from the cashmere goat (*Capra hircus laniger - right*), although today it is obtained from other varieties which are classified as cashmere because they have a fibre diameter of under 19 microns (one micron = 1/1000 millimetre or 1/25,000 inch). The cashmere goat produces a double fleece consisting of a fine, soft undercoat with a straighter and much coarser outer coating called guard hair. The fine undercoat can be gathered either by combing or separating it after the fleece has been shorn. Both processes are time consuming, making the wool expensive. Traditionally the test for a fine pashmina shawl is to pass it through a wedding ring.

These two samples are labelled 'fleece' and 'top and noil', as are several other in this box. The fleece is the untreated shorn wool. Tops are the long fibres and noils the short fibres that are left after the fleece is combed.

3 & 4 Alpaca

The Alpaca (*Vicugna pacos - below left*) is a member of the camel family which is native to the Andes mountains in South America. It looks a bit like a llama, but is much smaller. Like the llama, the alpaca was domesticated by the native people of this region, but unlike the llama it was never used as a beast of burden. Its value lay in its fine wool which was used to make blankets, sweaters, hats, gloves, scarves and ponchos.



In the nineteenth century the English textile merchant Sir Titus Salt developed a cloth made from alpaca wool and silk. It became very popular and was the foundation of Salt's great success. Queen Victoria wore dresses made of his 'Peruvian wool' and did much to promote the qualities of the fibre. His mill and Saltaire, the model village he built for his workers, is today a world heritage site.

5, 6 & 7 Camel

There are two varieties of camel - the one humped dromedary and the two humped Bactrian camel. Wool is harvested from the Bactrian camel (*Camelus bactrianus* - below left) which are native to Mongolia and have to withstand extremes of temperature from freezing to scorching. Their double coat consists of long outer hairs and soft inner down.



Traditionally, as with the cashmere goat, camel wool was gathered and separated after the animal had naturally shed its coat. They are able to produce about 7 kg (15 lb) of fibre annually. The fibre structure is similar to cashmere wool with a diameter of 16-18 microns and a length of 2 to 8 cm (13 inches).

8 Llama

Like the alpaca, the llama (*Lama glama* - right) is native to the South American Andes. It was domesticated by the Incas and other native peoples and used as a beast of burden, for its wool and for meat. A full grown llama can stand 6 feet (1.6 metres) tall. Llama wool is very soft and is naturally lanolin (wool grease) free. As with camels, cashmere goats and others, a whole llama fleece consists of two coats - guard hair and soft inner down. Guard hair is thick and was used by the Incas to make rope, blanket, sacks and the outer clothing of ordinary people. The down is soft and was suitable for finer garments. Individual fibres range in size from 20 to 40 microns in diameter.





Left: A Peruvian girl with a llama. Her traditional clothes are made from llama wool.

9 Vicuña



The vicuña (*Vicugna vicugna* - right) is another native animal of the Andes, however unlike the alpaca and the llama, vicuñas have never been fully domesticated. They live in mountain grassland areas where the temperature is hot during the day and freezing at night. The fibrous coat which they developed to cope with this environment is the finest in the world, having a diameter of 6-10 microns. In order to gather this fine wool the animals are herded into funnel traps every three or four years and then sheared. The wool was so highly valued in the past that only members of the Inca aristocracy were allowed to wear it. It is still valuable today and poachers sometimes shoot vicuñas in order to gain their fleece. Unrestricted hunting is one of the reasons why vicuña numbers declined from perhaps a million in Inca times to only about 6,000 animals in the 1960s. By 2000, the species had recovered to about 80,000 but it is still considered endangered.

At present, the Peruvian government has a labelling system that identifies all garments that have been created through a government sanctioned *chacu* (funnel trap). This guarantees that the animal was captured, sheared alive, returned to the wild, and cannot be sheared again for another two years. The programme also ensures that a large portion of the profits return to the villagers. However, annually up to 50,000lb (22,700kg) of vicuña wool is illegally exported. Because of this, some countries have banned the import of the wool in order to save the animal.



Each vicuña will only produce about one pound (0.45kg) of wool in a year. An alpaca, by contrast, might produce fifteen pounds (6.8kg) in a similar period. Attempts to domesticate the animal have proved fruitless. This has led to experiments at cross breeding the vicuña with the more controllable alpaca. Results were initially promising. However, after just two or three generations, the offspring became sterile.

Left: Peruvian lady with young vicuña.

10 Merino



The merino sheep originated in North Africa, descended from a breed of sheep developed during the Roman period. From there they were taken to Spain, where they were valued for their heavy, fine fleece. Before the eighteenth century the export of merinos from Spain was illegal. Restrictions were lifted in the eighteenth century and the merino was used as the foundation of merino flocks in other countries.

Today the merino is the most numerous breed of sheep in the world. It is widely bred in Australia, New Zealand and the USA. It is prized for its wool, although it can also be farmed for its meat. Super fine merinos are regarded as having the finest and softest wool of any sheep. The merino is not a breed which is farmed in Britain.



11 Corriedale

Corriedale sheep are a dual purpose breed - they are used both in the production of wool and meat. They were developed between 1880 and 1910 in New Zealand. The aim was to create a breed that would thrive in low rainfall areas and have long fibred wool. They are now distributed across the world, making up the greatest population of all sheep in South America and they also thrive in Asia, North America and South Africa. They are not, however, common in the UK.

12 Scotch Blackface



The Scotch blackface is the most common breed of sheep in the United Kingdom, comprising about 30% of the national flock. The origins of the breed are uncertain. It was probably developed on the borders of England and Scotland, but it is not clear exactly when they became a distinct breed. They are a tough breed, often found on exposed moorland. Both sexes are horned (a ram and a ewe can be seen on the right) and they have black legs as well as a black face. They have long coarse wool that shields them from moisture and biting winds. It is used to make mattresses and carpets. It is also blended with other kinds of wool to make strong wearing clothes. The finest Scotch blackface wool goes to make the famous Harris tweed, from the Western Isles of Scotland.



13 Mohair

Mohair usually refers to the wool of the angora goat - not the wool of the angora rabbit, which is called angora! The angora goat is thought to have originated in the mountains of Tibet and to have been taken to Turkey sometime before the sixteenth century. The Sultan of Turkey placed a ban on the export of raw fleece and for several centuries the fleece and goats were restricted to Turkish territory. Mohair is very fine, strong and lustrous - which explains why it was so valued. A single goat produces between 10 and 17lb (5-8kg) of wool per year. Goat shearing is done twice a year, in contrast to that of sheep which are shorn only once. Mohair is not widely produced in the UK.

19 Devon Closewool

The Devon closewool is a medium sized, white faced, hornless sheep with a dense white fleece of medium length. The Devon closewool's original home was Exmoor but it is now spread throughout Cornwall, Devon, Somerset and parts of Wales.





20 Improved Dartmoor

This sheep is descended from the tough animals which lived on Dartmoor in the seventeenth century. In the ninetenth century they were crossbred with Nottinghamshire and Leicester longwools to create the modern breed, which is also known as the greyface Dartmoor. They are hornless, deep bodied and short legged, with densely woolled hind legs and head. The fleece was used in the manufacture of blankets, carpets, cloth and serge. Once common on Dartmoor and neighbouring Exmoor, there were said to be only 1,800 breeding greyface ewes in 1997.

21 Suffolk

The original Suffolks were the result of crossing Southdown rams on Norfolk horned ewes. The Suffolk was a recognised breed in 1810. They are a large breed with a distinctive all-black head and legs that are free of wool. They are often used for meat production, rather than wool. They are very popular in the USA.





22 Leicester

The Leicester was developed in the eighteenth century by Robert Bakewell, who was the first to use modern animal breeding techniques in the selection of livestock. Using these practices he developed the Leicester longwool from the old Leicester sheep. He transformed a slow growing sheep into an animal that put on weight more rapidly and produced less waste when slaughtered. They had a curly, lustrous fleece. Leicesters were quickly adopted by American colonists and were very important in the development of American sheep breeds, although today they are rare. They were also widely used in Australia and New Zealand.

23 Shropshire

The Shropshire breed originated in central western England. The breed became known by the name it now bears in 1848. Shropshires are medium to large in size, with dark faces and wool on the legs. They were first imported into the USA in 1855 and became a popular and influential breed there.





24 Swaledale

The Swaledale breed is named after the Yorkshire valley of Swaledale. They are found all over the more mountainous areas of the UK, but particularly in County Durham, Yorkshire and the lower fells of Cumbria. They are noted for their off-white wool, and curled horns. They are also used for production of mutton.

25 Wensleydale



The Wensleydale is a large longwool sheep with a distinctive deep blue head, ears and legs. The breed originated in North Yorkshire, England during the nineteenth century and was developed primarily to provide rams for crossing onto the hill ewe. The breed's greatest attribute is the quality and quantity of curly wool each sheep produces. Wool from the Wensleydale is widely acknowledged as the finest lustre long wool in the world.



26 Welsh Mountain

The Welsh Mountain breed has survived for centuries in the harsh environment of the mountains, where high rainfall and freezing winter temperatures make it impossible for anything other than the hardiest and fittest to survive. Its breeders gave the highest priority to factors such as hardiness, good milk production, mothering ability and lamb survival. It is popular for producing succulent, tasty meat.

27 Shetland



The Shetland's roots go back over a thousand years, probably to sheep brought to the Shetland Islands by Viking settlers. It is a primitive, unimproved breed noted for its natural hardiness, lambing ease, longevity, and ability to survive under harsh conditions. It is one of the smallest breeds of sheep. They have no wool on the face and nose, bright eyes and small erect ears. The ewes are usually hornless (polled) but the rams usually, but not always, have horns. Shetland sheep are famous for their colourful wool upon which the Shetland woollen industry is based. There are 11 main colours as well as 30 markings, many still bearing their Shetland dialect names. These names include moorit (reddy/brown), shaela (silvery grey), krunet (white crown), katmoget (dark belly) and gulmoget (light underneath).

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Roman Cloth Fragment



Wool was the main material for clothing in the Greek and Roman world. Cotton, for example, was known, but was a rare and expensive material. This fragment was found in the dry conditions of Egypt, which are good for preserving otherwise fragile material.

Karanis , where this fragment was found, was founded in the third century BC, probably by Ptolemy II Philadelphus, and was originally inhabited by the mercenaries of his army. With a population of some 3,000 people, it continued to prosper for about seven centuries. Many Papyri have been found there.

Two Wool Samples



Wool can be spun in many different ways. The carpet wool sample is made from two strands and is in bright colours. The tapestry wool is finer and more subdued.

Cloth Sample Book



Using dyed wools and arranging the threads in complex ways when weaving can create many different patterns and textures. This booklet illustrates some of the hundreds that are available.

Dewsbury Blanket Sample



Dewsbury is in a town in the heart of the Yorkshire Heavy Woollen District. It was one of the key textile centres in the area and was famed for its production of shoddy and mungo which is made by cutting or tearing apart existing wool fabric and respinning the resulting fibres. As this process makes the wool fibres shorter, the remanufactured fabric is inferior to the original. The recycled wool may be mixed with raw wool, wool noil, or another fibre such as cotton to increase the average fibre length. This blanket was produced for William McIlroy, a large department store at the western end of Broad Street, Reading, which was in business until 1955.

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Cloth Samples

Some of the many kinds that are available.

Mohair. Made from the wool of the angora goat. The weave features loops.
Suiting. A plain weave.
Gaberdine. Gaberdine is smooth on one side and has a diagonally ribbed surface on the other.
Flannel. A warm fabric made from loosely spun yarn.
Afgalaine. A plain-weave, all-wool dress fabric.
Barathea. A worsted fabric with twill (diagonal parallel ribs) hopsack weave.
Worsted Georgette. Worsted cloth has had the natural crimp of the wool fibre removed in the process of spinning the yarn. Georgette (originally a trademark) is a clothing fabric with a dull, creped surface.
Velour. Velour is a closely napped fabric resembling velvet, used chiefly for clothing and upholstery.
Serge. A twilled cloth of worsted or worsted and wool, often used for suits.
Blazer Flannel. Flannel printed with school colours.
Fancy Suiting. A highly textured weave.
Harris Tweed. Harris Tweed is a luxury cloth that has been handwoven by the islanders on the Isles of Harris, Lewis, Uist and Barra in the Outer Hebrides of Scotland, using local wool. Every length of cloth produced is stamped with the official Orb symbol, trademarked by the Harris Tweed Association in 1909.
Check Tweed. A tweed with the dogstooth design.
Tweed. A rough, unfinished cloth with a soft, open, flexible texture. It is made in either plain or twill weave and may have a check or herringbone pattern. The original name was *tweel*, the Scotch for 'twill', but in the nineteenth century a London merchant is said to have mist**a**k**en** the term for the name of the river Tweed and the name has remained so ever since.
Blanket. A thick cloth with a fuzzy surface made by metal spiked rollers after weaving.
Double-sided Blanket. Two cloths are woven on the loom at the same time and combined to create a very warm fabric.