

Felting - There are two types of felting processes: needle felting and wet felting. The former works by striking the piece of wool with a series of needles, producing a less stable material which can be taken apart and re-carded. With the water method, the wool piece is moistened with warm water; the fibres are then crossed manually through rotating movements of the hands. To aid these movements, a neutral soap is used. Would you like to see how it works? Scan the QR code to see the video tutorial. Felt hats and boots are made with moulds, whether of wood or metal: the wool is placed around them and then subjected to water vapour at high temperatures.

Spinning - Some spinners prefer to spin the wool before it is thoroughly washed because lanolin facilitates its processing. The wool is placed on a tool which in Italy goes by many names, depending on geographical location, but which all refer to the distaff. A long rod whose extremity is divided into several slats to form an empty space was used to hold the wool high. By allowing the right amount of wool to pass through her fingers, the spinner shaped an initial quantity of yarn to collect around the spindle. As she rotated the spindle, the yarn twisted around it, becoming thinner and more resistant. The distaff and spindle were later replaced by the spinning wheel and the yarn swift, the latter used to unravel tangled wool.

Carding - This step is needed to unravel the tufts in order to get a homogenous mass. This lends elasticity and insulating capacity to the material. The piece of wool that is thus obtained is used as lining for cushions and mattresses. Carding was once performed with large, toothed brushes (with nails or finer material for the teeth). In other cases, a toothed compartment was used, in which a board, which was also toothed, would tilt back and forth, allowing for larger quantities to be carded, though more coarsely. The wool piece to be used for spinning was then combed such that the fibres ran in the same direction.

Scouring - After the skirting process, which takes away vegetable and earth impurities from the fleece, the wool is scoured with running water to remove the lanolin and debris. If moved very slowly, wool can also be washed with warm water. Drying must take place in a well-aired area which is not exposed to direct sunlight. Once it is washed, insects which feed on the wool can attack it more easily; it is thus recommended to preserve it with bay leaves.

Shearing - Sheep are shorn twice a year: in spring and in autumn. Shearing can be performed with manual scissors or electric razors. The result is the fleece, which in turn is made up of tufts. The quality of the wool differs between the two shearings, because one is the fruit of life in the stall, while the other takes place after months in pasture. The various parts of the fleece have different characteristics as well. The longer fleece from the back is of better quality (1), while that coming from the shoulders and hips is the worst (8). Quality also depends on how the animal has been kept and on pre-shearing treatments. For example, washed wool comes from sheep that have been cleaned before shearing, perhaps in a river. Raw or greasy wool is wool that is dirty; pulled wool comes from dead animals, while virgin or shorn wool is taken from live ones.

TRADITIONAL PROCESSING STAGES AND USES

Illustration: Apparent length / Resistance / the wool makes a sound / Elasticity

QR code:] Would you like to see how a wool mattress is made and learn about its characteristics? The Filo & Fibra Community Cooperative has revived artisanal production of this product. Scan the QR code to find the skin: coarse wool will be itchy, while fine wool can be used for soft, refined products.

Finally, the wool's imbrication, that is, the way the scales overlap on the cortex, determines how it feels on makes a sound, then it's suitable for spinning!

are made with moulds, whether of wood or metal: the wool is placed around them and then subjected to water vapour at high temperatures.

#### INNOVATIVE AND EXPERIMENTAL USES

In agriculture: when broken down or liquified, wool can be used as fertiliser; as mulching; as covering for trunks of plants which are not indigenous to northern Europe; to create growth substrates for biodynamic or hydroponic cultivation (to see a video on an experiment by the P.I.R. Association which uses wool in hydroponic cultivation, scan the QR code). Be careful about the substances used to treat the wool, which could cause hygienic and health problems: misuse can be dangerous!

In construction: for thermal or acoustic insulation; in land bio-architecture together with earth to replace straw.

In the transport of goods: for thermal insulation for packaging meat and fresh products. As part of the process of maize-based package moulding.

In the health and medical field: physiotherapy accessories for muscular or joint inflammation. Keratin is extracted for prostheses which repair cartilage.

A recipe - Yogurt made in a wool cooking container, which are produced by the Filo & Fibra Cooperative. Take a small container of yogurt and a litre of milk, both whole or low-fat. Heat the milk to 30° C, pour the yogurt into it and stir to get a homogenous maixture. Close the pot and put it in the container. The virgin wool of the container will keep the temperature constant, and in 10-12 hours your yogurt will be ready to eat ... plain or with honey, jam, cereal, fresh fruit or edible flowers! Use the QR code to see the video tutorial.

#### COOKING CONTAINER

Illustration: virgin wool lining / wool-padded cushion lid

#### RAISED BIO-BED

Illustration: wire mesh / wool / earth / compost / pallet

Man's relationship with sheep has created economies, embodied spiritual values, opened transit ways, generated languages and traditions, and made possible the creation of cultural products that range from foodstuffs to textiles and building materials for dwellings.

Today, we have replaced all of this with petroleum-derived products; in just under 50 years, the production chain for processing sheep's wool has broken up in Italy, together with the knowledge of its unique characteristics.

This booklet hopes to help in the process of rediscovering this product, but above all it wishes to make people aware of the wealth of connections and experiences that it offers ... to those who are able to listen to what it has to say.

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taut with two hands as you bring it toward your ear. With your middle finger, pluck it like a guitar string; if it if the fibre didn't break while you pulled it, you can perform a second test for resistance. Hold the fibre to get its true length.

Apparent length: when you pull a fibre out of a tuft, it will be wave-shaped; extend it by pulling on the ends it to return to its original volume.

so it can be stressed and twisted at the spinning wheel.

To perform the elasticity test, take a ball of wool and press it in the palm of your hand: see how long it takes to return to its original volume after being compressed; for the latter, the wool must be long and resistant deciding what it will be used for: lining or spinning? For the former, elasticity is needed, namely the ability of a fleece or a part of it is necessary for Assessing the characteristics of a fleece or a part of it is necessary for Elasticity, resistance and length -

States.

was promoted by the Aragonese and the Bourbons, and the Sopravissana, which was created in the Papal several Italian breeds whose wool is suitable for spinning, such as the Gentile di Puglia, whose production wool, such as that of Sarda and Bergamasca sheep, is called open fleece. On the other hand, there are Those breeds which are raised for their milk or meat produce wool which is of poor quality for textiles; this Sheep also have fibres that resemble the type of hair called bristle.

some types of pigs! Dogs and cat, for example, produce hairs, but in greater quantities than they do wool. member, though, that wool is produced by other mammals as well, such as camels, goats, rabbits and even Types of wool and fleece - There are as many breeds of sheep as there are types of wool. We must re-

Wool takes many years to biodegrade; if immersed in water, though, it 'melts' in just a few months.

a stable temperature (insulation).

wool is perfect for healing joint and muscle inflammation. This dynamic also underlies its ability to maintain Thanks to its structure, wool acts as a breathable fabric which is able to take out moisture. For this reason, when they come into contact with warm water, absorbing it. This process produces heat.

hygroscopicity: insulating and breathable - ... in fact, once the lanolin has been removed, the scales open repel water ...

its structure and the presence of the lanolin that covers the fibre. But be careful ... wool doesn't always Water repellency - Wool does not hold moisture: water runs off its surface. This happens both because of and for preserving leather hides and musical instruments.

The dermis of sheep produces a wax coating, called lanolin, which covers the fibre. It is used in cosmetics with heat and close with cold: for this reason, wool is felted with hot water and movement!

cortex, which is in turn covered by the cuticle. The cuticle is made up of scales (like fish scales), which open The core of the fibre is called the medulla (the medullary canal, which is empty). It is surrounded by the CHARACTERISTICS OF THE FIBRE

smallmento come rifiuto = disposal as waste product.

ching / ri-carditura per riciclo = re-carding for recycling / Italy / China India Australia / import export / Illustration: filatura = spinning / imbottitura = lining / coibentazione = insulation / pacciamante = mul-

sent world. Wool boasts a rich past and has a promising future!

for the rural economy of our country; it can become so again, giving new value to the objects of our pre-

Wool has unique characteristics: we will learn about them in this booklet. Wool was an important resource

## IVING INTO WOOL

### Booklet 1

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#### INTRODUCTION

Environmental sustainability - In Italy, 6.2 million sheep produce 12,000 tons of wool every year, much of it rustic. Fleece from mutton sheep is not well suited to spinning. The European Union considers such fleece a special waste product and requires expensive disposal procedures, creating costs which must be added to those for shearing.

It is difficult to quantify how much fleece is disposed of improperly, but we export almost all of our leftover fleece to China and Australia. We in turn import mohair from Australia, which is produced by the Angora goat. Very little wool, if any, stays in Italy.

Over the years, we have lost skills and above all parts of the production chain which once allowed us to produce much wool. But sheep farming is important not only for the production of food and wool: it is also crucial for protecting the land from hydrogeological imbalance. Like sheep tracks,1 pasture is a precious asset that needs to be safeguarded for the health of the land.

Circular economy Wool can be used as a substitute for many non-recyclable petroleum derivatives: it can be as thermal and acoustic insulation in construction, as packaging material in transport, as felting and lining in clothing and furniture, for germinating seedlings in place of synthetic and imported substrates, and as covering and mulching in agriculture and gardening.

Wool is almost always recyclable, such that disposal costs can always be absorbed along the production chain.

Social and cultural sustainability Sheep farming forms the basis of many social and cultural aspects of our country: the seasonal movement of sheep from winter to summer pastures (known as transhumance, which was added to UNESCO's intangible cultural heritage list in 2019) creates interconnections between territories; encounters and conflicts between farmers and shepherds, whose relationships are based on the tension between fertilisation of the fields, which is guaranteed by the passage of flocks, and defending private property; the development of languages and idioms used only by shepherds;2 a certain type of social organisation of those who stayed behind to take care of the home (the women); and transversal knowledge, such as astronomy (especially lunar cycles) and meteorology.

The different breeds of sheep are a cultural product as well, the result of centuries of genetic selection! Large families and powerful lords became wealthy through the wool trade, giving rise to a social structure which is still evident today. Typical and unique products became associated with particular sheep-farming territories: Russian valenki boots, the traditional clothing of South Tyrol, Sardinian rugs and bags, Mongolian yurts, and all the various hats and cloaks... a rich and long list of wonders!

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INTRODUCTION

Migration and preservation of our natural heritage -Sheep farming requires migrations to guarantee fresh forage for the animals, from the plains to the mountains in summer and vice versa in autumn. This type of movement is called transhumance, which was recently added to UNESCO’s immaterial cultural heritage list. Today, we no longer appreciate how complex the organisation of grazing has always been and how dangerous and adventurous the life of an errant shepherd1 can be, as he or she crosses lands belonging to others!

Many animals move from place to place, following the seasons, the sun and the earth’s rotation. Among humans, some peoples have made a lifestyle of these migrations between regions and countries, called nomadism. Others, even though they live a sedentary life, established in one place, have had to migrate for various reasons: to flee war or other conditions that make survival difficult, such as famine, drought or a lack of work. An individual, family or entire people who leave their homes to go to live somewhere else are referred to by different names: for the country from which they leave they are emigrants, while for the one where they arrive they are immigrants; in both cases, they are migrants.

Many people have emigrated abroad from Italy, heading above all to Australia, Latin America, Belgium, France and Germany. Other Italians, meanwhile, have changed regions, leaving the places of their birth to move mainly to Lombardy, Piedmont, Lazio, Emilia-Romagna and South Tyrol.

Italian emigrants typically came from small towns and villages, whether in the mountains or the countryside, and no one has replaced them. Those arriving in Italy from abroad generally go to cities, where it is easier to find work.

For this reason, a significant percentage of our national territory is witnessing the phenomenon of depopulation: fewer and fewer people live on the land and take care of it. The result is that a precious heritage has been abandoned to the ravages of time.

Mountain fields which were mowed from season to season are now becoming wooded (the phenomenon of reforestation). This causes great problems of hydrogeological instability: landslides and floods. Buildings that were constructed through age-old techniques are crumbling, and we are forgetting how local materials were once used. The very capacity to make a land productive is represented by a complex of skills and knowledge that we risk losing.

In addition, fewer and fewer Italians are involved in breeding and agriculture; in the regions of southern Italy, 43% of farm workers are foreigners who are only hired seasonally.

There exists a close connection between agriculture, animal husbandry, the natural heritage and migrant flows. Above all, there is an important equilibrium dynamic among these elements on which our capacity to enjoy a large part of the land of Italy depends.

My grandmother taught me how to salt cheese and how to be patient; my father not to be afraid; my mother how to count; my grandfather to respect nature; and my brother to be steadfast and many other things. . . In a word,

my story shows that there’s strength in unity. But our real secret was to be bold, to fully live our lives according to the heritage of knowledge and skills that were passed down to us. Cheese and animals need a lot of attention; the most important thing for me has been not to ever lose sight of the aim of my dreams. I built a small wooden house in front of my cheese factory, where my little boy Giuseppe is growing up: every day he gives me the gift of his existence, his gaze, his smile and his little voice that always calls me mummy. Eleonora Puggioninu

ART LAB

If you think that wool only comes from sheep, you’re wrong! Many animals produce wool fibre, including some goats, such as the Capra hircus, from which come cashmere and the Angora goat . . .and all of this in spite of the saying ‘wrangling about a goat’s hair’, which means creating a problem that doesn’t really exist. Once they have been shorn and combed, fibres are used to make yarn, woven fabric and felt. Try to guess which animals in the cover drawing produce wool. Colour them, following the instructions of our milk-painting lab. Then take a close look at the pages of this booklet to see if you were right. From left to right in the drawing, you’ll see a deer, a camel, fish, a mountain dog, an alpaca, a buffalo, a Merino sheep, a Silkie hen and an Angora rabbit.

Milk-painting Art Lab

You’ll need:

- a few cups or small glasses;
- a few pens;
- a small mortar and pestle; if you don’t have one, you can use scissors to break up the materials and then use something to crush them in a cup or glass, such as a wooden spoon with thick handle end;
- some milk . . . ideally sheep’s milk, just so we don’t get off topic ;-)
- half a cup of coffee, half a cup of red wine, spinach and/or nettles, turmeric powder.

Put the wine and coffee into two small glasses and the milk into a container from which it is easy to pour. If you have a mortar and pestle, crush a few spinach or nettle leaves until they become a paste. Put the turmeric powder and green paste into separate glasses.

With your paintbrush, use the coffee and wine to directly colour violet and brown parts of the drawing. Use the milk to blend the turmeric powder and the green paste; it works as a binding agent.

Milk-dyeing Art Lab

For this Art Lab, in addition to the materials above you’ll need:

- a piece of white fabric made of cotton, linen or woollen thread – whichever you use, make sure the piece hasn’t been treated;
- a small pot;
- a burner.

You can choose whether to dye your fabric with just one colour or to make a decorative pattern. In either

The landscape: a common heritage - According to the European Landscape Convention (2000), ‘landscape’ refers not only to a particular part of a country’s territory but rather to how that territory is experienced and perceived by its inhabitants. The Italian constitution was one of the first to incorporate the safeguarding of its landscape into its articles, even if it interprets it as a series of assets (tangible and intangible) which are important from a historical point of view. Today we know that landscape means much more.

The relationship which citizens have with their land has social consequences, in particular on their ability to feel that they are an active part of a community. It also affects health, since land which is polluted, dirty or lacking in, for example, green spaces causes both physical and psychological problems to those who live on it. It further influences the ecosystem, both locally and globally: today we understand that what we do in one place has wider-ranging effects, as it can have an impact on the climate and air and water quality of other places. For this reason, Europe and other regions of the world have set themselves common goals to defend the environment, such as the Green Deal and the UN Agenda of Sustainable Development Goals. The landscape therefore also forms part of our cultural heritage. As the Faro Convention (2005) sets forth, it is the inheritance of the entire community, which is made up of persons who even if they do not live in a particular place wish to assure that it is taken care of. These are important matters which demand a broader sense of responsibility, which includes defending our rights and performing our duties.

ELEONORA: the story of a shepherdess

My name is Eleonora, and I’m a shepherdess. My story is the fruit of the encounter of two wonderful lands. It began long before I was even born! Now, I’m going to tell you my tale. . .

In the 1970s, my grandfather Giuseppe and his brother decided to emigrate. They chose to go to Tuscany, specifically to the Crete Senesi, the area near Siena known for its clay soil. Here, among abandoned farms and unstable terrain, they saw the possibility of creating a future for their families. So they left Sardinia (an ancient island in the middle of the Mediterranean) with my grandmother, my father (the first of nine children, who at the time was five years old), my uncle and all their flock. It took a lot of work to get the farmsteads that they had bought into shape, as the land was poor and they had no electricity or running water. But they managed to turn the land into cultivated fields and pasture suitable for the animals and to make the houses comfortable for the entire family.

The years went by, and my father became a handsome young man. By chance he met my mother. . . they both came from shepherd families! The only difference is that my mother is Tuscan and my father Sardinian. Together they bought a farm in Radicofani, and soon after my brother and I were born.

Luca and I grew up immersed in the world of farming and sheep herding. Even though we had to leave home and move far away to go to school at a very young age, our dream was always to have children ourselves one day and raise them on the land where we were born, so that our family would become one big team.

In 2005, the magical moment arrived when we made the momentous decision to start our common venture: to convert the old barn into a cheese factory.

Since then a lot has happened. Today we have 120 hectares of pasture at 400 metres above sea level and another 70 at 1000 metres, such that we have wild herbs and different cereals for all our animals. Luca and my father pay careful attention to what we feed our sheep, which are all of the Sarda breed.

The sheep are milked twice a day. The milk is brought to the cheese factory, where my mother and I await it to make it into cheese. We are helped by our cheesemaker, who is my father.

case, you’ll use the milk as the mordant.

A mordant is a substance used to fix colours. It is used either before or after dyeing, depending on the material and substance you are using.

To dye a fabric with just one colour, put it in the milk, take it out and let it dry.

To make a decorated pattern, dip the paint brush in the milk and paint the pattern on the fabric. To see your design, hold the fabric up to a light.

. . .then, in either case, fill the small pot with water and bring it to a boil. Then add tea or coffee or the peel of red onion. Let it boil for about half an hour, then immerse the fabric in the water. The longer you leave it in the water, the more intense the colour will be.

If you want to try another experiment, squeeze some lemon juice onto the fabric: depending on the dye you used, you’ll see the colour suddenly change!

When you take the fabric out of the water, let it dry. Then iron it or place it on a source of heat before washing it a second time.

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