



**taylor•made**

# Learning cards V 1.0

**ERASMUS+**

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Tailor-made. Contemporary. Innovative – the professional  
training of fashion designers and bespoke tailors



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# Icon explanation



BREATHABLE



HIGH MOSITURE  
ABSORPTION



LIGHT



GOOD THERMAL  
PROPERTIES



EASY  
TO CLEAN



BIODEGRADABLE



STRONG,  
DURABLE



HYPOALLERGENIC,  
SKIN-FRIENDLY

# Cotton

Is a natural fiber obtained from the fiber tufts of the fruits of the cotton plant. It is biodegradable and a renewable resource. The quality of the textile surface depends on the use of long-fiber or short-fiber cotton fibers.

The conventional cultivation of cotton has a very high water consumption and harmful use of pesticides, because the plant is very susceptible to pests, etc..



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



The use of cotton from controlled organic cultivation (kbA) is more environmentally friendly, since less water is consumed through the use of drip irrigation and organic fertilizers are used instead of pollutants. Furthermore, attention is paid to field

management, thus preventing or reducing soil leaching.

Man-made fibers from natural polymers viscose and lyocell can be used as a biological alternative.



## Advantages

- soft and skin friendly
- breathable
- heat resistant (washable at high temperatures)
- very high moisture absorption
- easy to clean and resistant



## Disadvantages

- due to low elasticity, the cotton fiber tends to wrinkle
- very good ink absorption, but the ink washes out over time
- wet cotton is heavy and dries slowly
- cotton shrinks when washed (pre-wash before processing into garments)"

# Hemp

Is an ancient cultivated plant that is currently being rediscovered and used in the textile industry.

The plant can be grown in almost any soil and climate while maintaining the same fibre quality and grows in only 80 to 120 days.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



No environmental disadvantages were found for hemp cultivation, but here too, attention should be paid to organic certification.

Cultivation uses very little water and no pesticides are used. The plant does not extract any nutrients from the soil, and even returns some.

Hemp is biodegradable and the yield is twice that of cotton.

Currently, most hemp comes from China and thus requires an unnecessarily long transport route. The reason for this is that it is difficult to grow in Europe.



## Advantages

- durable, hard-wearing and tear-resistant
- light weight
- good moisture absorption
- becomes softer and more comfortable on the skin when worn
- breathable
- resistant to bacteria, fungi and moths
- antibacterial effect, dirt repellent and odorless
- very high UV protection
- well dyeable



## Disadvantages

- initially very rough fabric
- creases easily

# Bamboo

Comes from the Asian region and is one of the environmentally friendly fiber materials. However, in reality bamboo is grown as a monoculture and even forests are cut down for its cultivation.

In the production of viscose, bamboo is used as a wood substitute for cellulose. Depending on the country, viscose is designated as this, even though bamboo forms the basis. Bamboo also has natural antibacterial agents and is odor-resistant.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



Bamboo is a rapidly renewable, insensitive natural fiber that consumes little water and requires little fertilization during cultivation. Since bamboo is used as a cellulose fiber for the production of the synthetic fiber viscose, the ecological balance is questionable.

Problems lie in the high use of chemicals and energy consumption in the manufacturing process. Up to 50% of these are not re-used and thus have a heavy impact on the environment.



## Advantages

- silky feel and shine
- light and breathable
- antibacterial effect
- odour repellent



## Disadvantages

- tends to pilling (small nodules on the top of the fabric)
- is not uniformly shown/labelled in the garment

# Kapok

Is a natural fibre and is obtained from the seed wool of the elongated fruits of the silk wool tree. The country of origin is Central America.

Kapok is quite unknown as a fibre, is called plant down and is used as a filling and upholstery material.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



So-called. Kapok trees grow wild, fast, do not need irrigation and do not need to be fertilised. The fruits for fibre production grow back and the tree does not have to be removed. The whole tree can be used with its wood, fibres and oily seeds and kapok is biodegradable.

The rapid growth of the trees is used for reforestation in the rainforests and one tree provides 20 kg of fibre per year. No chemicals are needed to process the fibre. Kapok is the vegan substitute for the down feather.



## Advantages

- extremely light and voluminous, thus good insulating and warming properties
- breathable
- moisture repellent
- durable and elastic
- self-cleaning, especially skin-friendly (suitable for allergy sufferers)
- no lumps and felting due to a smooth, waxed surface
- washable



## Disadvantages

- easily flammable due to the wax layer
- kapok down is dusty, fluffy
- is not used 100% of the time



# Ramie

Is a bast fibre originating from Asia, the so-called China grass. The plant consists of cellulose, can be 10 - 20 years old and harvested four times a year (the fibre yield is four times higher than cotton). The plant is very sensitive to frost and is therefore not cultivated here.

For better processing and for finishing textile surfaces, ramie is usually mixed with cotton or synthetic fibres. Since the production process is very complex, ramie is very expensive.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



Compared to cotton, linen or hemp, ramie is very costly to produce. In addition, a chemical lye is necessary to loosen the fibres from the plant for further processing. For this reason, ramie is used less in industry.



## Advantages

- glossy
- even, fine and light
- pure white (no longer needs to be bleached) and therefore easy to dye
- hard-wearing
- absorbent
- resistant to pests



## Disadvantages

- susceptible to creasing (similar to linen)
- complex and expensive to extract and produce

# Soy

Is also referred to as vegan cashmere and is becoming increasingly important in the clothing industry and fashion.

The production process is referred to as a closed cycle (cradle-to-cradle), as soy for the textile surface is produced from the waste products of the soy-bean industry.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



On the one hand, soy contributes to waste reduction because it is derived from the waste products in the soy industry. And due to cradle-to-cradle production, the toxins can be reused.

On the other hand, it has to be chemically treated for fibre production.

When growing soy, seeds should be used that are not genetically modified.



## Advantages

- smooth, soft structure
- shimmering sheen (similar to silk)
- skin-friendly
- temperature regulating
- high moisture absorption
- hardly creases
- easy to dye
- easier to care for than silk or cashmere
- biodegradable



## Disadvantages



# Nettle plant

Was already used around 100 AD for the production of fabrics. The fibres are obtained from the stems of the plant.

Due to the scarcity of raw materials during the First World War, nettle fibre regained importance at that time, but the ratio of cost and benefit soon caused the raw material to be forgotten again (high processing costs with a yield of 8% of the dried plant).

Today, there are a few stinging nettle fabrics on the market, mainly from Asian countries.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



The nettle plant is native and does not require fertilisation for cultivation. The fact that no chemicals are used in the production process also speaks in favour of this alternative.

The nettle is usually mixed and processed with organic cotton.



## Advantages

- pleasantly smooth
- very good moisture absorption
- skin-friendly
- easy to clean
- tear-resistant



## Disadvantages

# Linen

Has been used for textile production for thousands of years, is the oldest textile fibre in the world and is obtained from the stems of the flax plant (bast fibre).

However, the importance of linen was completely pushed back by industrialisation and the worldwide cultivation of cotton.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



The cultivation, extraction and processing of linen is environmentally and animal friendly. Comparatively, less pesticides are used in cultivation than in cotton and water consumption is also much lower. Linen is biodegradable.

However, the use of chemicals is also high when linen is crease-resistant. Toxins are also used in bleaching and dyeing. Sustainable alternative: certified organic linen, which stands for cultivation and production with fewer pesticides and toxins.



## Advantages

- skin friendly
- breathable
- slightly absorbent
- very tear-resistant (higher tear strength compared to cotton)
- smooth surface and correspondingly low dirt absorption
- antibacterial
- cooling effect
- half-linen (a blend of cotton and linen) is of great importance.
- linen)



## Disadvantages

- low elasticity
- creases strongly
- must be washed and cared for gently

# Tencel® / Lyocell

Refers to the most sustainable synthetic fibre, which is obtained from the wood of the eucalyptus tree. Tencel, also known as lyocell, is produced ecologically and sustainably, unlike the synthetic fibres viscose and modal (synthetic fibres made from natural polymers). The cellulose fibres of the eucalyptus are extracted using a non-toxic and almost completely recyclable solvent. Tencel is silky and soft, making it an alternative to the use of cotton and silk.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



As the chemicals are recycled during fibre production, the manufacturing process is closed. Since the fibres do not need to be bleached, fewer chemicals are needed. Eucalyptus trees also grow quickly, do not require pesticide use and consume less water.

The disadvantage is the high energy consumption in the production of the fibre and one can only speak of the most sustainable synthetic fibre if huge eucalyptus forest monocultures are avoided and Tencel is not treated with toxic chemicals such as paint.



## Advantages

- soft
- silky/silky-like
- slightly shiny
- pleasantly cool
- crease-resistant
- breathable
- absorbs moisture well
- anti-static
- hypoallergenic
- biodegradable.



## Disadvantages

- tends to pilling (small knots on the top of the fabric)
- must be specially cared for

# Lenpur

Is also called "vegetable cashmere" because the fibre is soft like cashmere and at the same time shiny like silk. The cellulosic fibre wood is obtained exclusively from branches and twigs of prunings.

Since the production process is very time-consuming and cost-intensive, Lenpur fibres are often spun with cotton fibres to produce textile surfaces or knitting yarns.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



The use of cutting residues prevents the clearing of forests.

The ecological extraction of the cellulose fibres is micro-organic and no chemical additives are used.



## Advantages

- soft
- light
- shiny
- breathable
- high moisture regulation (hygroscopic fibre = high moisture absorption and transport)
- good thermal properties (cooling in summer, warming in winter)
- absorbs odours with difficulty
- antistatic



## Disadvantages

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# Banana silk

Is the animal-friendly alternative to silk fibre and environmentally friendly, as after the banana harvest the plants are cut back and the resulting waste product is used for fibre production.

The long fibres are washed out of the trunk and spun into the fine banana silk yarn.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



The banana silk fibre comes from plantations where production is organic and neither pesticides nor herbicides are used.

The fibres are extracted from the cut stems by a mechanical process. New shoots can grow from the banana residues.

The producing artisan community of banana silk is a member of the WorldFairTrade Organization and thus BANANA-SILK fulfils the requirements for sustainable and fair textile production.



## Advantages

- textile surface with the look of wild silk
- high tear resistance and durability
- insensitive to grease
- very good moisture absorption and release



## Disadvantages

# Natural rubber

Is obtained as milky sap from the bark of the tropical rubber and caoutchouc tree.

The country of origin is South-East Asia and it is a renewable raw material.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



Compared to the production of synthetic rubber, the energy input is 90% lower.

Natural rubber is also known as natural latex and is used for mackintoshes, rubber boots, gloves and mattresses.



## Advantages

- very high elasticity
- very good elasticity
- tensile strength



## Disadvantages

- poor heat resistance
- can dissolve on contact with sunlight or UV light or grease

# Brewed Protein

Is an innovative material and was developed in years of research work by the Japanese company Spiber. It consists of sustainable, plant-based raw materials and is produced in a microbial fermentation process.

The fibre is environmentally friendly and its properties can be adapted to different uses.

The thermal qualities are comparable to wool.



Brewed Protein is a vegan fibre and makes a decisive contribution to the vision of plastic-free clothing. Unlike polyester and nylon, petroleum as a raw material is no longer a main component, the microbial manufacturing process contributes to the

reduction of greenhouse gas emissions and energy is saved.

The fibre is completely biodegradable and does not form environmentally harmful microplastics.



- Brewed protein can be spun into silk-like threads or into a yarn with a cashmere-like soft feel.
- The fibre has a pleasant feel and its thermal properties are comparable to wool fibre.
- The fibre can also be used in a special manufacturing process to make a very good fur or leather alternative.

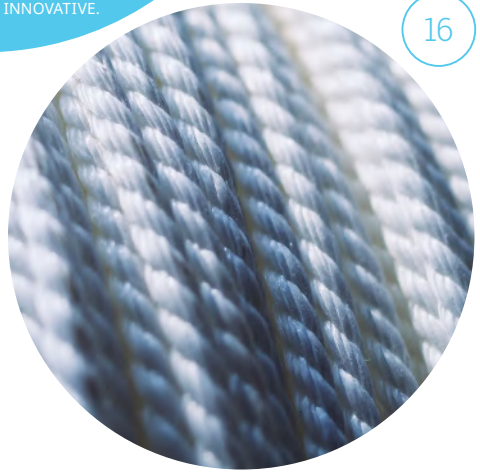




# Synthetic fibres

Are man-made fibres from natural (e.g. viscose, modal) or chemical polymers (e.g. polyester, polyamide).

Synthetic fibres made from natural polymers require a lot of energy and the use of chemicals. Synthetic fibres made from chemical polymers are produced from crude oil, natural gas or coal (non-renewable raw materials) by means of a chemical process.



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



Synthetic fibres are not to be generally rejected if they are acceptable from an ecological (pollutants and other environmental impacts) and economic (price) point of view. They can be processed just like natural fibres and in some cases leave a smaller

"ecological footprint" compared to conventionally grown and processed cotton or leather, for example.

Synthetic fibres are extremely durable and long-lasting and can be recycled and thus reused.



## Advantages

- insensitive to moisture and temperature
- fast drying, no shrinkage and crease-resistant
- very good moisture transport, very good heat regulation, breathable and water-repellent (functional clothing)
- tear and abrasion resistant
- good elasticity and stretch for high wearing comfort
- light fastness
- insensitive to micro-organisms and pests
- skin-friendly, pleasant to wear



## Disadvantages

- electrostatically chargeable
- odour-prone

# Recycling materials

Are synthetic fibres that remain in the cycle and are recycled. The classic example of recycling is the PET bottle.

Since textiles are almost always made of a mix of materials, recycling is often not easy, because recycling the material requires purity. Thus, in the textile sector, one often speaks of "downcycling" when a different product is created from recycled old mixed-fibre clothing and is usually inferior in quality.



**ECOLOGICAL  
FOOTPRINT**



**PRODUCTION  
COST**



The "ecological footprint" is reduced enormously by recycling synthetic fibres that do not end up in the rubbish. The topic of upcycling is becoming increasingly important in the textile sector, where more valuable products are created from used materials, e.g.

the production of bags from old truck tarpaulins. However, in this relatively new area of innovative and sustainable product design, the question remains as to whether the use of plastic and man-made fibres should be avoided in principle.



## Advantages

- The material properties are improved, deteriorated or remain the same depending on the type of recycling (recycling, upcycling or downcycling).



## Disadvantages

# Cork

Also referred to as cork leather or cork skin is a natural product obtained from the middle part of the bark of the cork oak. The 1.5 cm thick cork sheets are bonded with a natural, organic adhesive, cut into thin sheets, prepared and then applied like a patchwork with a water-based adhesive from both sides to a fabric backing and sealed (approx. 1 mm thick).

The term cork leather or cork skin is derived from the Portuguese "Pele de cortica".



## ECOLOGICAL FOOTPRINT



## PRODUCTION COST



Cork is an ecological and sustainable vegan material. Every 10 years, the raw material of a tree can be harvested and after harvesting, the tree does not have to be cut down.

However, the process for producing cork leather, especially in very high qualities for the textile sector, is very complex and cost-intensive.



## Advantages

- extremely thin
- flexible
- soft, supple, pleasant on the skin
- allergen-free
- extremely tear-resistant and robust
- water-repellent and easy to clean
- optic with natural marbling
- very good workability without fraying of the edges (comparison processing of thin leather)



## Disadvantages

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