Home Economics

Textiles, Clothing and Fashion

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Topic: Technological Developments

Group Level: Form Four

Instructions:

1. Read the information provided on the topic.
2. Review what you have learned by completing the worksheet.
3. Use the answer key to assess your performance.

Technological Developments in Fibres & Fabrics Construction

Two types of fibers have been available to human society, natural fibers that have existed for 4000 years and synthetic fibers. Due to limitations of natural fibers, synthetic fibers are developed and now-a-days developments are done in the fibers to achieve desired properties.

Lyocell

The continuous search for better, sustainable and environmentally friendly fabrics has led to some interesting inventions. One of such creations is the Lyocell fabric commonly known as Tencel. Lyocell is a natural, man-made material made from wood cellulose or pulp. This is done using an advanced solvent spinning process.
Lyocell is soft, breathable, lightweight and comfortable. It has an extremely smooth, soft surface that drapes beautifully to flatter every figure. Lyocell's smooth fiber surface feels soft and supple against the skin and its incredible wicking abilities keep the skin dry, making lyocell a great fabric for sensitive skin.

Advantages

Durability - Fibers are smooth, elastic and are very resistant to wrinkles.
Fabric texture - Very smooth, soft surface that drapes beautifully. Soft, breathable, lightweight and comfortable.
Anti-bacterial - Lyocell is said to be anti-bacterial because of its moisture management property.
Moisture absorbent - Has greater moisture absorption than cotton and natural breathability. Perfect choice for people with sweating issues, or for people with sensitive skin aggravated by moisture.
Appropriate for sensitive skin - The wicking abilities of Lyocell materials keep the skin dry and the smooth fiber surface feels soft and supple against the skin. This makes Lyocell fabrics great for sensitive skin.
Flexible - Lyocell fabric has controllable fibrillation, this means it can be arranged in various ways from a silky smooth finish to a suede-like softness.
View the following You Tube video on lyocell

https://www.youtube.com/watch?v=brPHZ3Ls1Rg

Geo-textile

A geotextile is typically defined as any permeable textile material used to increase soil stability, provide erosion control or aid in drainage. Geotextiles have been in use for thousands of years and were basically natural fibers or vegetation mixed directly with soil. Modern geotextiles are usually made from a synthetic polymer such as polypropylene, polyester, polyethylene and polyamides. Geo-textiles can be woven, knitted or non-woven.

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https://ar.m.wikipedia.org/wiki/%D9%85%D9%84%D9%81:Geotextile-GSI.JPG
Public Domain

Large roll of geotextile to let water through but hold back the sand/coastline

https://www.flickr.com/photos/surveying/25333701423
Jnzl's Photo CC BY 2.0

Self-cleaning textiles

The concept of self-cleaning textiles is based on the lotus plant whose leaves are well-known for their ability to self-clean by repelling water and dirt. The textile surface of self-cleaning textiles can clean itself without using any laundering action. Australian researchers have recently developed self-cleaning textiles, that is, clothes that wash themselves. The method involves growing special nanostructures, which can degrade organic matter (read: dirt) once they are exposed to sunlight. ***View the following You Tube video to learn more about self-cleaning textiles*** https://www.youtube.com/watch?v=xLoXgyMkq8c

Medical textiles

Medical textiles are textile products and constructions for medical applications. They are used for first aid, clinical or hygienic purposes and rehabilitation. Examples of their application include: Protective and healthcare textiles, dressings, bandages, pressure garments and prosthetics.

Textiles materials that are used in medical applications include fibres, yarns, fabrics and composites. Depending upon the application, the major requirements of medical textiles are absorbency, tenacity, flexibility, softness and at times biostability or biodegradability.

Fibres used in medical field may vary from natural fibre such as cotton, silk, regenerated wood fluff (absorbent layer), to, manmade fibres like polyester, polyamide, polyethylene, glass etc.

Glossary

Polymer - a substance which has a molecular structure built up chiefly or completely from a large number of similar units bonded together, e.g. many synthetic organic materials used as plastics and resins.

Nanostructure - any structure with one or more dimension, measuring in the nanometer scale range, that is, 10–9 m.

Permeable - allowing liquids or gases to pass through it.

Worksheet

30 mins

INSTRUCTIONS:

- **Answer All Questions**
- **Use the Answer sheet to check your responses**

1. DIRECTIONS: On the line to the left of each statement, write the word from the list that best fits the statement. **Each response from the list may be used once, more than once, or not at all.**

List of words

Self-cleaning	Versatile
Cellulose	Lyocell
Medical Textiles	Geo-textiles
Nanostructure	Properties

i. _____ Main raw material for Lyocell.

ii. _____ Use is based on properties like softness and lightness.

iii. _____ Cleans itself without laundering.

iv. _____ The fabric of the future.

v. _____ Used primarily for first aid, clinical and -hygienic purposes.

vi. _____ Ideal material for soil stability.

vii. _____ Multipurpose uses like bed linens, shirts, trousers, towels.

viii. _____ Can degrade organic matter.

ix. _____ Uses less water and energy for production.

x. _____ Made from a synthetic polymer.

(10 marks)

2. Name and describe TWO advantages of Lyocell fabrics.

(i)……
……

(ii)……
……

(6 marks)
Total 16 marks

Answer Key

1. DIRECTIONS: On the line to the left of each statement, write the word from the list that best fits the statement. **Each response from the list may be used once, more than once, or not at all.**

i.	Cellulose	Main raw material for Lyocell.
ii.	Medical Textiles	Use is based on properties like softness and lightness.
iii.	Self-cleaning	Cleans itself without laundering.
iv.	Lyocell	The fabric of the future.
v.	Medical Textiles	Used primarily for first aid, clinical and -hygienic purposes.
vi.	Geo-textiles	Ideal material for soil stability.
vii.	Versatile	Multipurpose uses like bed linens, shirts, trousers, towels.
viii.	Nanostructure	Can degrade organic matter.
ix.	Lyocell	Uses less water and energy for production.
x.	Geo-textiles	Made from a synthetic polymer.

(1 mark for each correct response)

(10 marks)

2. Name and describe TWO advantages of Lyocell fabrics.

(i) Durability - Fibers are smooth, elastic and are very resistant to wrinkles.

(ii) Fabric texture - Very smooth, soft surface that drapes beautifully. Soft, breathable, lightweight and comfortable.

(iii) Anti-bacterial - Lyocell is said to be anti-bacterial because of its moisture management property.

(iv) Moisture absorbent - Has greater moisture absorption than cotton and natural breathability. Perfect choice for people with sweating issues, or for people with sensitive skin aggravated by moisture.

(v) Appropriate for sensitive skin - The wicking abilities of Lyocell materials keep the skin dry and the smooth fiber surface feels soft and supple against the skin. This makes Lyocell fabrics great for sensitive skin.

(vi) Flexible - Lyocell fabric has controllable fibrillation, this means it can be arranged in various ways from a silky smooth finish to a suede-like softness.

(1 mark each for any two advantages = 2 marks)

(2 marks each for each description = 4 marks)

(6 marks)

Total 16 marks

14 – 16 Excellent	11 – 13 Good
10 and under – Review information and try again	

Reference

https://www.usfabricsinc.com/products/geotextiles

https://study.com/academy/lesson/what-is-geotextile-fabric-definition-types.html

https://sewport.com/fabrics-directory/lyocell-fabric

https://textilelearner.blogspot.com/2014/09/self-cleaning-textiles-new-concept-of.html

https://www.technicaltextile.net/articles/medical-textiles-2587

Lyocell Fabric

https://commons.wikimedia.org/wiki/File:Lyocell_Vital_fabric.jpg License under CC BY-SA 3.0

Video: Lenzing Group, Tencel, Lyocell with Refibra Technology
https://www.youtube.com/watch?v=brPHZ3Ls1Rg

Video: SciSapien Self Cleaning Textiles

https://www.youtube.com/watch?v=xLoXgyMkq8c