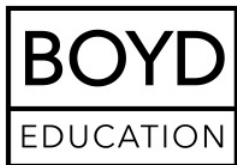


#ThinkDo Cards

Materials

By Paul & Julie Boyd

This resource will be updated and developed over time. If you have received this resource before it may be worth replacing your file with the more up to date version.



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#ThinkDo Resources



- This resource supports the content of some of our courses. See more about our courses at <http://www.julieboyd.co.uk/workshops-2/calendar/>
- #ThinkDo cards are designed as structured retrieval activities and can be used as general classroom activities, homeworks, extension activities or as low stakes tests. They can also be used for display.
- The #ThinkDo cards are mapped against our 10 Key Learning Areas in D&T document which can be found at <http://www.julieboyd.co.uk/dt/dt-curriculum-planning/10-key-learning-areas/>. Over time our long-term goal is to produce at least one card that references learning from this document.
- The cards have an image and a series of questions designed to prompt learners to think more deeply about D&T, whether it be from the perspective of an exam, the non exam assessment, or simply to encourage a wider interest in design generally.
- The slides can be printed and used as A4 worksheets or they can be trimmed to the size of the cards. Changing the settings on the printer also means the size of the resource can be changed e.g. to print 4 cards onto an A4 page. The A4 slides could be laminated to create a reusable resources with learners writing around the card using dry erase markers.
- New #ThinkDo cards are produced all the time linked to a variety of KS3, 4 and 5 learning areas. Free Jpeg #ThinkDo cards are given away each week on our Facebook page (www.facebook.com/julieboydonline) and are also posted on our blog at <https://goo.gl/1lwCVi>.

Mixing Materials



#ThinkDo

Name the materials used in the products in the images.

Name a primary source each material is made from.

Describe the properties of each material.

Describe the stock form each material is available in.

Describe the process of changing each source material from its primary state to its stock form.

What other products might each material be used for?



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#ThinkDo

Name the materials used in the products in the images.

Name a primary source each material is made from.

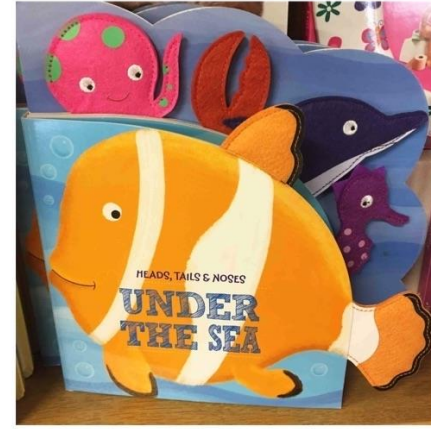
Describe the properties of each material.

Describe the stock form each material is available in.

Describe the process of changing each source material from its primary state to its stock form.

What other products might each material be used for?

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#ThinkDo

These products are made out of at least 2 materials. Each material has been used for a different reason and each has different properties.

Name the materials that might have been used in each product.

Identify the properties of each of the materials in the products.

Research a range of other products that mix materials together.

What would you design?



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#ThinkDo

What is the primary source of the material used in these products?

What properties does the source material give each product?

Describe the process of changing the primary source material into the materials used in the products.

What other products might this material be used for?

What are the advantages of using this material for these products compared to the traditional materials that might be used?

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#ThinkDo

These products are all made from the same source material. What is it?

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#ThinkDo

Copper & felted wool bangle by designer Laura Mabbutt from 'Copper Collection' jewellery range



www.lauramabbutt.com/copper-collection

Laura combines felted wool with copper components often used in plumbing. How do the 2 materials work together to create interesting and unusual products?

Explain the process used to create wool felted fabrics.

What other products might felted wool be used for?

Laura uses Merino wool. Compare this to other types of wool.

What are the properties of copper & why do these need to be considered when designing & making with this material?

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#ThinkDo



A display at Crich Tramway Village showing different materials used for tram seating over the years: wood, leather, moquette & imitation leather.

What are the advantages & disadvantages of each material?

How do these materials compare with the ones used on modern trams, buses & trains?

What material properties & other factors would a designer need to consider when choosing materials for public transport seating?

#ThinkDo



Investigate the packaging used for a Pringles tin.

How many materials are used to make a Pringles tin?

Explain the purpose of each of the materials.

Evaluate how easy it would be to recycle the tin and consider how sustainable the packaging is.

How does the packaging for Pringles compare to packaging used for similar products?

Why might the packaging appeal to consumers?



#ThinkDo

How might levers and mechanisms be used in these costumes & animatronics?

What types of textiles and other materials might be used in these costumes?

Many of these costumes are big and heavy. Recommend ways that they can be designed so they are light and comfortable to wear.

What would you design?

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#ThinkDo

Name a polymer that would be suitable to create the food tray on this high chair.

What are the properties of the polymer that make it suitable for the food tray.

What properties would the material used for the legs on the high chair need to have?

Name a material that would be suitable for the legs.

How might anthropometrics have been considered when designing the high chair?

How might ergonomics have been considered when designing the high chair?

Name a textiles material that would be suitable to make the seat pad out of.

Compare this design of high chair to others that are on the market.

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Metals

#ThinkDo

Ferrous or non ferrous?

Aluminium

Properties?

Sources?

Uses?

Processing?

Stock forms?

Advantages?

Disadvantages?

Finishes?

Sustainability & impact?



#ThinkDo



Copper

Ferrous or non ferrous?

Stock forms?

Properties?

Advantages?

Sources?

Disadvantages?

Uses?

Finishes?

Processing?

Sustainability & impact?

#ThinkDo

Metal Foam

How is metal foam produced?

What are the properties of the material?

What might this material be used for?

What are the advantages of using this material?



#ThinkDo



Stainless Steel

Properties?

Ferrous or non ferrous?

Advantages?

Sources?

Stock forms?

Disadvantages?

Uses?

Finishes?

Processing?

Sustainability & impact?

#ThinkDo

Titanium naturally fuses with bone and its hypoallergenic properties help prevent infection making it suitable for use as joint replacements, such as these hip and knee joints.

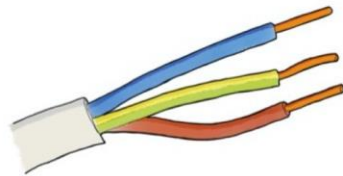
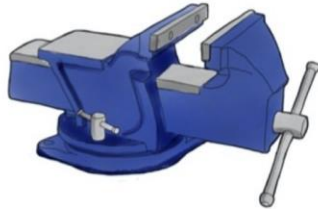
What are the other properties of titanium?

What else might titanium be used for?

What are the advantages of titanium over other metals?



#ThinkDo



What material am I
made from?

Which of the following is a
ferrous metal?

- a) Copper
- b) Aluminium
- c) Stainless steel
- d) Tin

Which of the following is a
non ferrous metal?

- a) Mild steel
- b) Cast iron
- c) High carbon steel
- d) Brass

Paper & Board



#ThinkDo

A fold up stool made of recycled cardboard

What gives the stool its strength?

Where and when might the stool be used?

What are the advantages & disadvantages of using cardboard to design with?

What would you design using this material?



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#ThinkDo

Corrugated Card

Properties?

Sources?

Uses?

Processing?

Stock forms?

Advantages?

Disadvantages?

Finishes?

Sustainability & impact?





#ThinkDo

This knitting yarn is made out of paper

The label on the yarn gives instructions on how products made out of the yarn might be cared for. What does each diagram mean?

Why might products made out of paper yarn be stronger than you might think?

What would you design?

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#ThinkDo

Foam Board



Properties?

Sources?

Uses?

Processing?

Stock forms?

Advantages?

Disadvantages?

Finishes?

Sustainability & impact?

Polymers

#ThinkDo

Thermoforming or thermosetting polymer?

Properties?

Sources?

Uses?

Processing?

Stock forms?

Advantages?

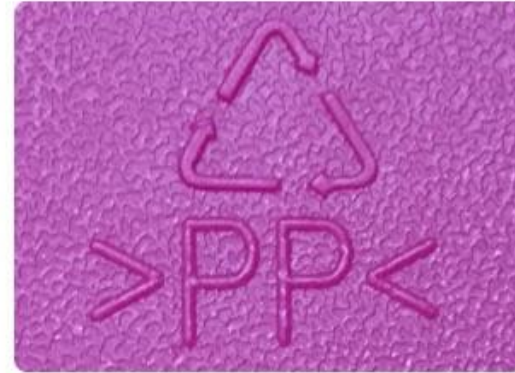
Disadvantages?

Finishes?

Sustainability & impact?

Polypropylene





#ThinkDo

Product focus: Beach chair

What material is this beach chair made out of?

What other products might this material be used for?

What are the advantages of designing this product so it can be stacked?

What else might make this product appealing to a consumer?



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#ThinkDo

These products are all made out of polypropylene.

What products can you see around you that are made from this material?

Polypropylene is a thermoforming material. What does this mean?

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Timber

#ThinkDo

Hardwood or softwood?

Beech

Properties?

Sources?

Uses?

Processing?

Stock forms?

Advantages?

Disadvantages?

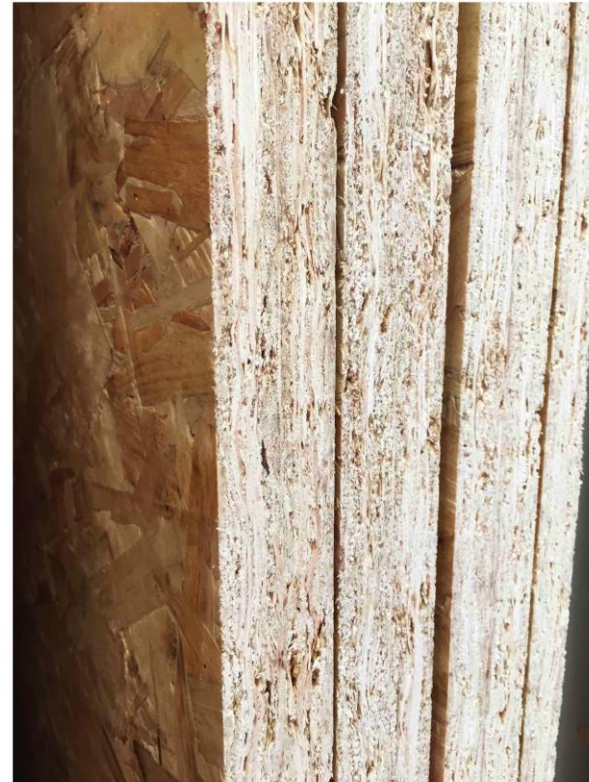
Finishes?

Sustainability & impact?



#ThinkDo

Chipboard



Properties?

Processing?

Finishes?

Sources?

Stock forms?

Advantages?

Classifications?

Typical uses?

Disadvantages?



#ThinkDo

This material is a maple veneer.

Is maple a hard or soft wood?

What is a veneer? When might it be used?

What would
you design
using this
material?

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#ThinkDo

Plywood

Properties?

Sources?

Classifications?

Processing?

Stock forms?

Typical uses?

Finishes?

Advantages?

Disadvantages?



#ThinkDo



Teak

Properties?

Hardwood or softwood?

Advantages?

Sources?

Stock forms?

Disadvantages?

Uses?

Finishes?

Processing?

Sustainability & impact?

#ThinkDo

The image shows a radiator cover made from MDF.



What does MDF stand for?

Explain why MDF might be used for a radiator cover?

Give examples of other products MDF might be used for?

How might the aesthetic qualities of MDF be improved?

Evaluate the sustainability of MDF as a material for making products out of.

Textiles



#ThinkDo

The jacket is made out of linen fibre, the tie out of silk, the shirt out of cotton & the coat and sweaters in the shop window are made out of wool.

Name 2 properties of each fibre that makes it suitable for the product it has been used for.

What other products might these fibres be used for?

These textiles fibres are known as 'natural fibres'. Why do you think that is?

Name the original sources of these fibres.

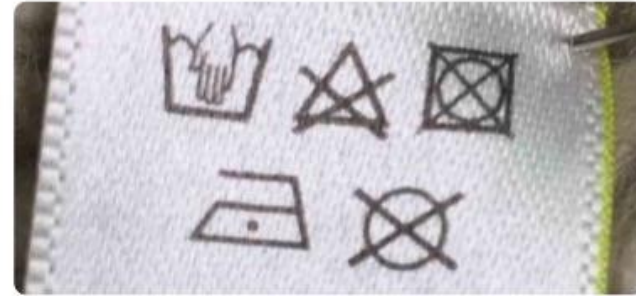
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#ThinkDo

- Properties of cotton?
- Names of fabrics?
- Fabric finishes used?
- Types of products used for?
- Fibres blended with cotton?
- Meaning of the cotton symbol?
- Environmental impact?
- Differences between organic & non organic cotton?

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#ThinkDo

Are the fibres in this hat natural or synthetic?

What properties does each fibre have?

What are benefits of blending these fibres together?

What information does the care label give on how to care for the hat?

The hat is knitted. What properties does this give the hat?



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#ThinkDo

What does the Woolmark symbol mean?

What is the difference between the Woolmark symbol and the Woolmark blend symbol?

What types of products might you find these symbols on?

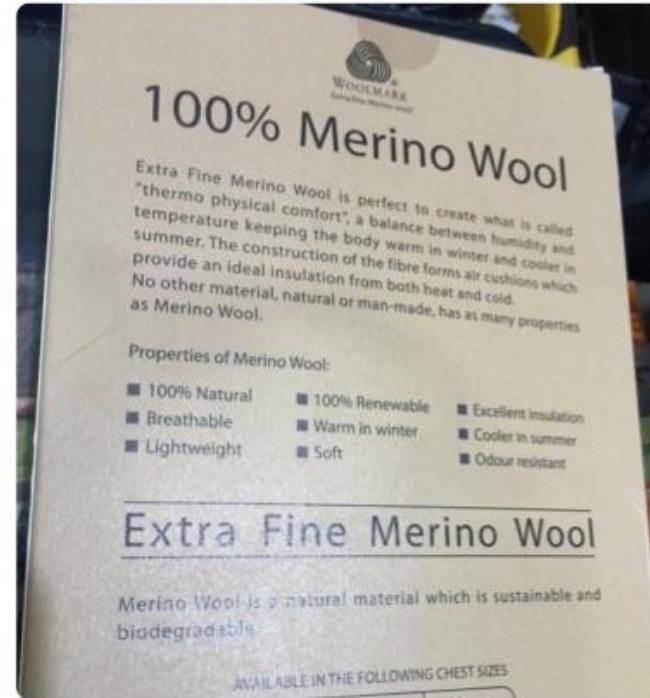


There is a third wool symbol called Wool Blend Performance. What does this look like?

These symbols are all registered trademarks. What does this mean?

Find out more at
www.woolmark.com

www.julieboyd.co.uk



#ThinkDo

Merino wool base layer t.shirt

What does the term 'base layer' refer to?

Why is Merino wool suitable for this product?

What does the term 'breathable' refer to?

What does the Woolmark symbol on the box mean?

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#ThinkDo

Sources of hemp?

Properties?

Uses?

Advantages & disadvantages?

Environmental impact?

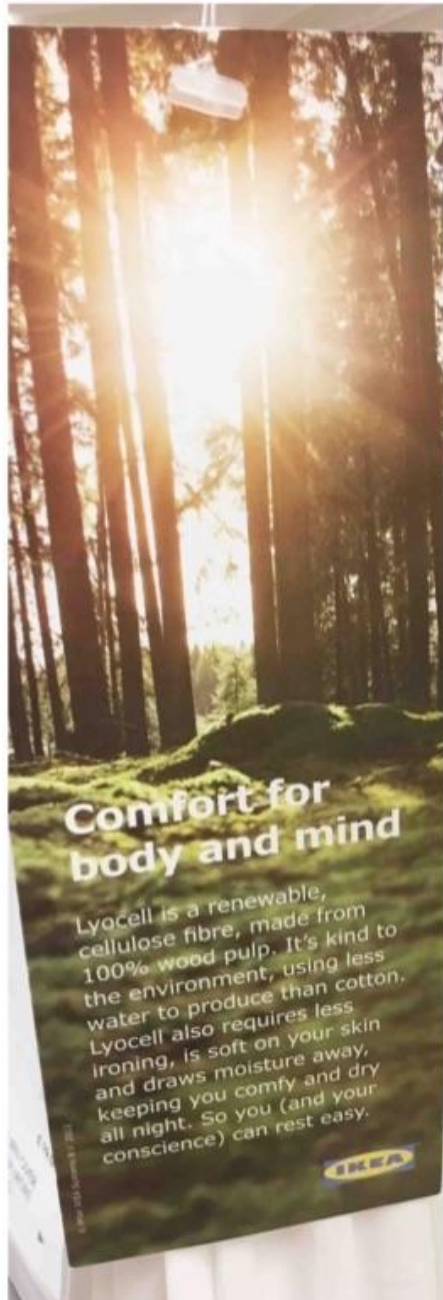
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Why is hemp considered a controversial material by some?

Find out more about hemp:

www.thehempstore.co.uk

www.hempfabric.co.uk



#ThinkDo

Properties?

Uses?

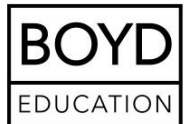
Lyocell is considered a sustainable fibre because it uses a closed loop production system. What does this mean?

Information has been provided on lyocell on the product in the photo. Why has the retailer done this?

What brand name is lyocell also known as?

Find out more at <https://goo.gl/KfeMk4>

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#ThinkDo



The strap on this Apple Watch is made from woven nylon. What are the advantages & disadvantages of a woven nylon strap?

Compare a woven nylon strap to straps made out of other materials.

What other materials might be used in the watch?



#ThinkDo

These jeans have elastane to make the fabric stretchy.

What is another name for elastane?

The elastane is used as a core fibre. What does this mean?

How does elastane add value to the produce for the consumer?

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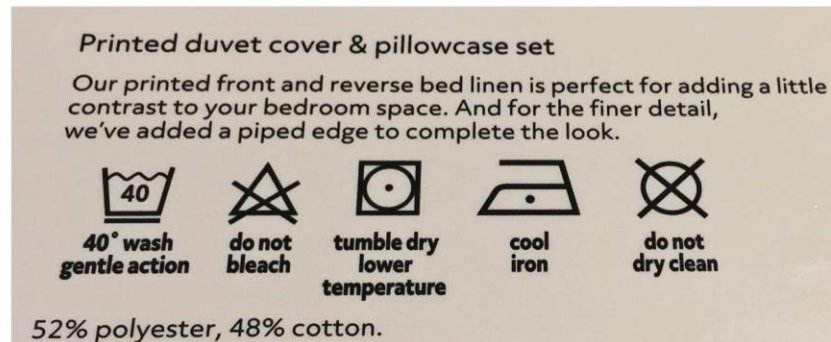
#ThinkDo

This duvet set is made from a blended fibre. What does this mean?

What are the properties of the blended fibre the duvet set is made out of?

What are the advantages of duvet set being made from a blended fibre?

The information on the label says the duvet set has been printed, that the fabric has 180 thread count and that a piped edge has been used. Explain what each of these means.



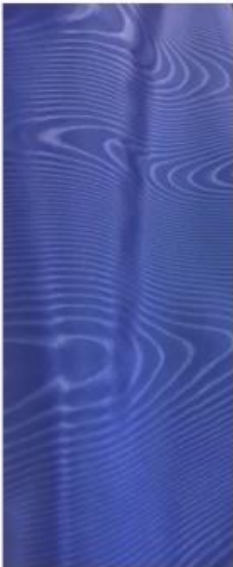
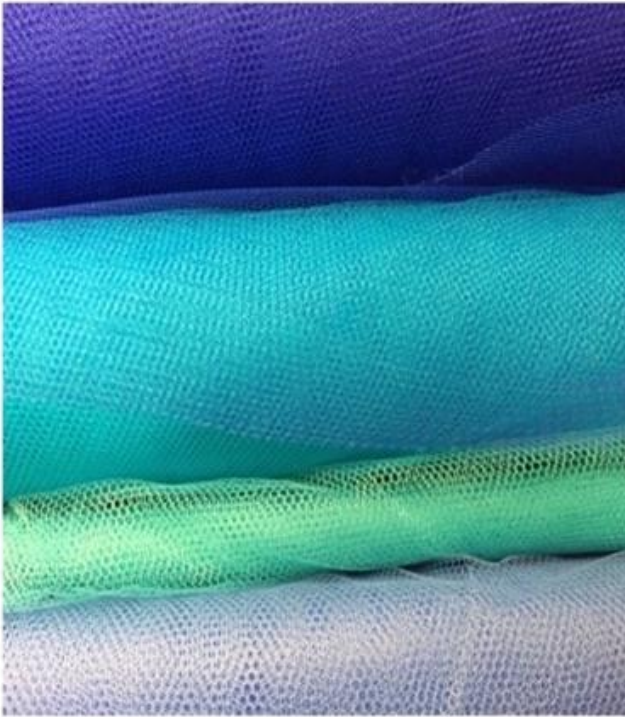
#ThinkDo



Fishing nets

What types of materials might these fishing nets be made out of?

What properties must the materials have?



#ThinkDo

What are the qualities of these net, organza & taffeta fabrics?

How might these fabrics be used to represent design themes linked to marine life?

What other types of fabrics can you name that might also be used to interpret this theme?

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#ThinkDo

The distressed look on jeans is a popular fashion trend.

How might this effect be achieved?

Why do you think this is a popular fashion trend?

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#ThinkDo

Explain why a water repellent fabric finish might be applied to the following products:

Rucksack

School uniform

Men's jeans

Fabric finishes help ensure fabrics are fit for purpose.

Analyse the need for fabric finishes used on a range of products.

Include examples of products, fabrics & finishes to illustrate the points you make.

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BIONIC FINISH RUDOLF®
The invisible fibre protection system

- 💧 water-repellent (PFOA-, PFOS-free)*
- 💧 oil- and soil-repellent
- ➔ breathable
- ★ preserves colours and fabrics
- 🌊 makes textiles dry faster
- 😊 makes fabric care child's play
- 🧺 resistant to washing and dry cleaning

After washing, it is recommended to iron the textile in order to re-activate the protective system.





#ThinkDo

What specification points would be considered when choosing fabrics for seat covers on public transport?

The seat fabric could be made of a blend of wool and nylon. Why might these two fibres be used?

What other types of fibres would you recommend to the manufacturer?

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#ThinkDo

What does the term 'performance' mean in this window display?

What types of fibres or finishes might have been used to add performance properties to the suit?

Why are the performance properties of the suit being used to market it?

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#ThinkDo

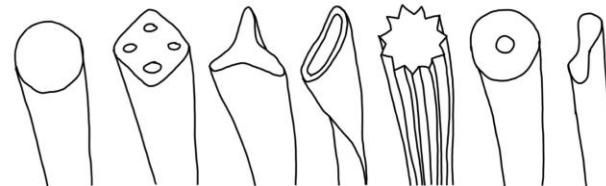
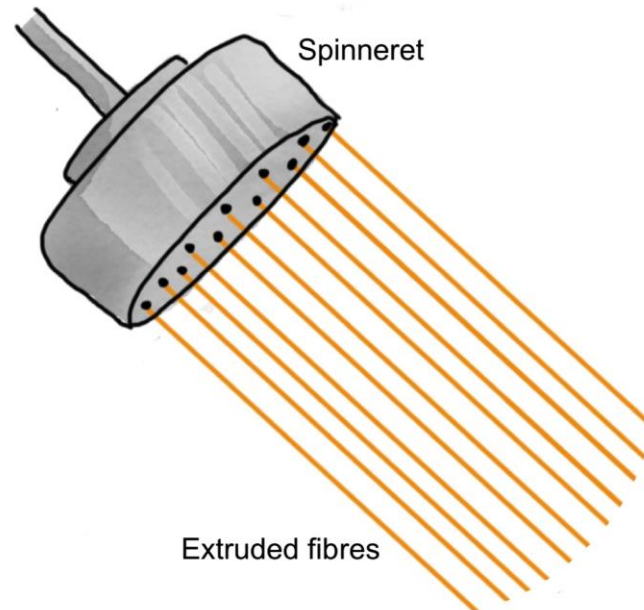
What synthetic textiles fibres can you name?

Why might the surface of a synthetic fibre be shaped or textured?

The spinneret produces continuous filament fibres. What does this mean?

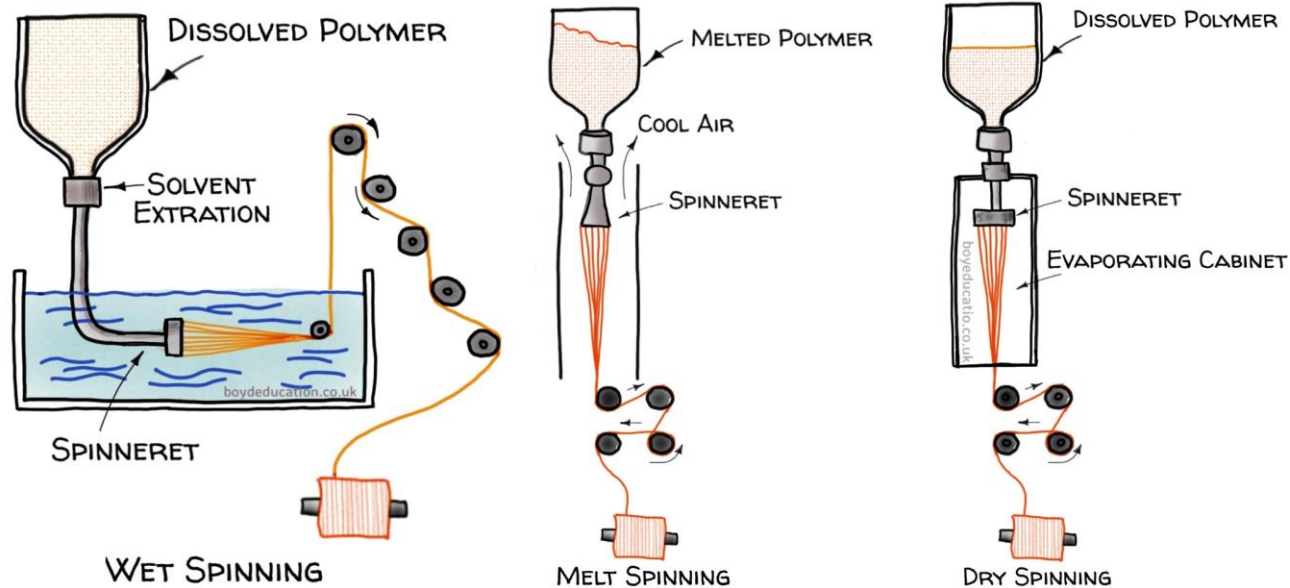
Why might continuous filament fibres be cut up into short staple fibres?

Synthetic textiles fibres are extruded through a spinneret. The properties of the fibre can be changed by using a shaped spinneret nozzle.



#ThinkDo

The diagrams show 3 ways of spinning man made fibres.



All 3 methods extrude a polymer solution through a spinneret. Explain what this means.

The diagrams illustrate how the fibres are solidified after extrusion. Compare the 3 methods of doing this.

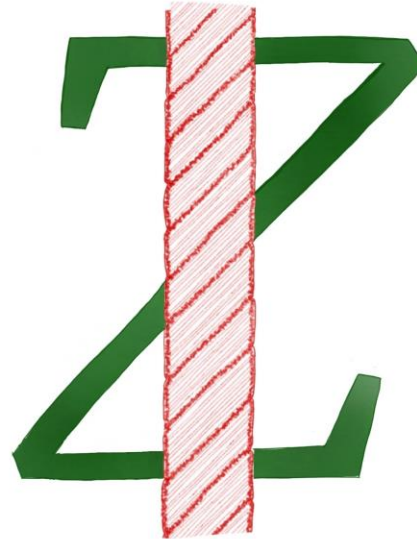
Name examples of fibres each spinning method creates.

#ThinkDo

S Twist Yarn



Z Twist Yarn



What do the terms 'S twist' and 'Z twist' refer to?

What properties do the different types of twist add to a yarn?

What does the term 'ply' refer to and why is this important?

Draw a diagram to represent a 4 ply yarn.



#ThinkDo

What do the following words on the packaging of these tights refer to?

Opaque
Denier
Lycra
Thermal

How do each of these add value to the product for the consumer?

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#ThinkDo

This dress has a knitted top & a woven skirt joined at the waist.

What is the difference between the 2 methods of fabric construction?

What are the advantages of using a knitted fabric for the top & a woven fabric for the skirt?

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#ThinkDo

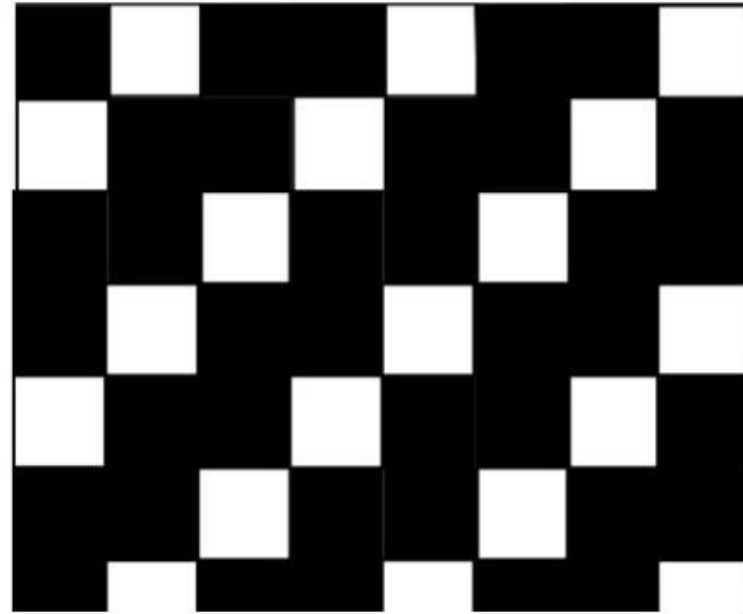
This storage basket is made out of a non woven fabric.

What are the different ways a non woven fabrics might be made?

The fabric has been cut into strips and woven together to create a new fabric. What type of weave has been used?

What other products might be made out of a non woven fabric?

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#ThinkDo

What is the name of the distinctive weave used in the construction of denim fabric?

Describe the appearance of this weave on the right & wrong side of the fabric

What are the advantages of this weave?

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#ThinkDo

This knitted throw is made from acrylic.

What are the advantages of the throw being made from a knitted fabric?

Is acrylic a natural or synthetic fibre?



Knitted throw
100% acrylic.
Approximate size 125cm x 150cm
Care and use
• It's machine washable - you can wash it at 30°C. You'll find it in the home section.



What are the properties of acrylic that make it suitable for use as a throw?

The tag says the throw can be washed in a washing machine. Draw the care label for the throw, including information on washing, drying and ironing.



#ThinkDo

Advent calendar t.shirt

What is the white backing you can see on the back of the advent calendar doors?

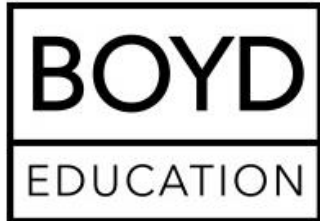
What is its purpose?

What else might it be used for?



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