



FABRIC *and fashion*



KS2 Teacher's Notes



Summary

Pupils will find out about a range of fabrics, their properties and uses through observation, discussion and scientific investigation. They will consolidate their learning through playing a team game, and then use imagination and problem-solving skills to design a garment for the future.

Please see overleaf for detailed learning objectives.

Cross-curricular links: Speaking and listening, design & technology

This plan can be used as a half day workshop or extended into a series of lessons.

You will need (not supplied in this pack):

- Examples of 5 or 6 common fabrics made into Fabric Packs e.g. wool, denim, silk, nylon, cotton, fleece. Fabrics should be cut into pieces no smaller than 20cm square. Each pack needs to contain the same fabrics
- Each group/table will need one Fabric Pack
- Further fabric pieces for Testing Fabrics investigations
 - for Investigation 1 we suggest; denim, silk, polyester
 - for Investigation 2 we suggest: denim, wool, elastane/Lycra
- Testing equipment – sanding blocks or sandpaper, measuring jugs, bowls for water, stopwatches/timers
- Space to play the game

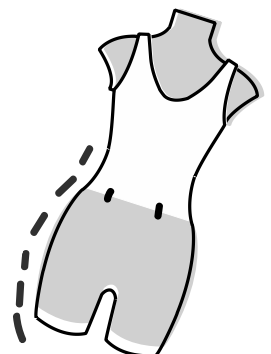
Resources included in this pack:

- Classroom PowerPoint slides
- Films x 3:
 - What is the M&S Company Archive?
 - Fabric & Fashion Investigating Fabrics film
 - Fabric & Fashion Innovation film
- Printable worksheets
- Background information on fabrics - at end of Teacher's Notes



Learning Objectives Lower KS2

- Lower KS2
- Ask questions and use different types of scientific enquiries to answer them
- Working Scientifically
- Set up simple practical enquiries, comparative and fair tests
 - Make careful observations and take accurate measurements using standard units, using a range of equipment
 - Record findings using simple scientific language, drawings, labelled diagrams
 - Report on findings through oral and written explanations or presentations of results and conclusions
 - Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
 - Identify differences, similarities or changes related to simple scientific ideas and processes
 - Use straightforward scientific evidence to answer questions or to support findings



Learning Objectives Upper KS2

Upper KS2

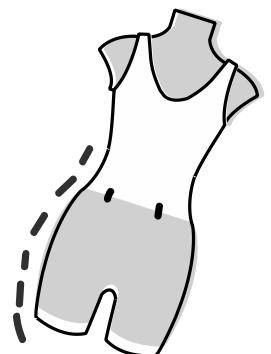
Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Record data and results of increasing complexity using scientific diagrams and labels
- Use test results to make predictions to set up further comparative and fair tests
- Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- Identify scientific evidence that has been used to support or refute ideas or arguments.

Upper KS2

Properties and Changes of Materials

- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials



Plan

Time	Activity	Content	Resources
0-2	Intro film	What is the M&S Company Archive? Our Education Officer will show you around.	What is the M&S Company Archive? film
2-10	Fabrics	Starter discussion Q. What are fabrics? Q. How many different fabrics can you name?	Slide 4
10-30	Investigating Fabrics	Using senses to explore fabrics. Identify different fabrics and their uses, present your discoveries to the class.	Slide 5, Fabric Packs
30-40	Making Fabrics	Find out what the terms 'natural' and 'synthetic' mean when talking about fabrics Q: Can you name any natural fabrics? Q: Can you name any synthetic fabrics?	Slide 6, List of fabrics pupils made from Slide 3
40-60	Play Find the Fabric	Find out how much you've learned about fabrics. Find the right fabric and score points for your team.	Slide 7, Fabric packs, space to play, paper to keep score
60-65	Testing Fabrics	Find out why we test fabrics. Watch F&F: Investigating Fabrics film. You can do one or both of the following tests, or split your class in half – each half doing one test (in small groups).	Slide 8, F&F Investigating Fabrics film
65-90	Investigation 1: Tree-Climbing Trousers	What properties will your trousers need? Examine fabrics and predict which one will be most suitable. Think about how to make sure your tests are fair. Test the fabrics.	Slides 9-10, Per group: fabrics, sanding block, timer, Fabric Investigation Record
90-115	Investigation 2: Swimsuit	What properties will your swimsuit need? Examine fabrics and predict which one will be most suitable. Think about how to make sure your tests are fair. Test the fabrics.	Slides 11-12, Per group: fabrics, bowl of water, measuring jug, timer, Fabric Investigation Record
115-150	Future Fashion	Watch Fabric & Fashion: Innovation film. Invent an innovative piece of clothing. Think about what properties the clothing would need to have. Draw your clothing on the worksheet. Explain how your design solves a problem.	Slides 13-14 F&F: Innovation film, Future Fashion worksheet, drawing equipment
Plenary	Future Fashion Gallery	Create a display of your finished designs. This could be a physical and/or virtual display.	Slide 15 finished Future Fashion worksheets, display space



Intro film: What is the M&S Company Archive?

This is a short film to give some context to the learning resources as part of the archive collection. Our Education Officer will show you around the archive and explain what we do and why.

Suggested opening questions after watching the film;

Q. Who has heard of M&S?

Q. Who has been inside an M&S shop?

Q. Do you think that M&S is a big company or small company?

- There are around 900 M&S stores in the UK
- We have stores in 45 different countries around the world

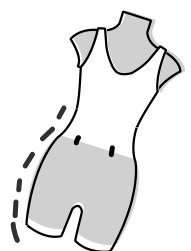
Q. Do you think it is an old company or new company?

- M&S was established in 1884 in Leeds Market

Q. Why is it important to keep and look after things from the past?

- So that we can learn about what life was like for people in the past
- To help us to understand how and why something has happened
- To inspire us and give us ideas for the future

You can find out more about the history of the business on our website and our My Learning pages – see Useful Links at the end of the Teachers Notes.



What are fabrics?

Class discussion/enquiry question

We're going to explore fabrics, where they come from, their properties and uses.

A fabric is something you can make clothes out of (it is one type of material from which a thing is or can be made e.g. metal, brick, glass etc).

Q: How many different fabrics can you name?

Make a list or spider diagram.

Extension ideas:

- Can pupils identify any of the fabrics they are wearing?



Investigating Fabrics

You will need: Fabric Packs - examples of 5 or 6 different types of common fabrics e.g. cotton, fleece, wool, denim, silk, polyester cut up into pieces no smaller than 20cm square. Each group will need the same fabrics in their pack.

- Split pupils into groups.
- Explain we're going to use our senses to explore fabrics. Ask what our five senses are (we're not going to taste, but will use the other 4 senses).
- Hand out one Fabric Pack to each group.
- **Key questions:** Ask pupils to think about what each fabric looks like, feels like, sounds like (when scrunched or rubbed together) and smells like (this works well with leather and wool).
- Can they identify any of the fabrics? What would they be used to make?
- Ask each group to present one of the fabrics to the class, explaining what they have discovered, what they think/know it is and what it could be used to make.

Extension ideas

- Can pupils spot fabrics that are opposites e.g. rough and smooth, thin and thick, stretchy and rigid.
- Look at the labels in your clothes, what are your clothes made of? Make a tally chart to record how many times each type of fabric is found.

Making fabrics – natural or synthetic?

You will need: The list of fabrics you made during the opening activity

Explain what the two terms mean

- Natural – from a plant or animal
- Synthetic or man-made – made using chemicals in a factory

Look at the list of fabrics you made as a class.

Q: Can you name the natural fabrics?

A: For example, wool, linen, cotton, silk

Q: Can you name the synthetic fabrics?

A: For example, polyester, nylon, lycra, acrylic

Extension ideas

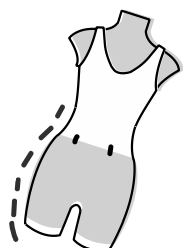
Make a card match game for the fabric packs.

- Each pupil (or in pairs) choose a fabric from the fabric pack
- They write a card for their fabric, giving clues to help identify it.
For example –
 - I am a natural fabric
 - I am stretchy and light
 - I am used to make jumpers and socks
- They then put all the cards from their group together and swap with another group.
- Pupils have to read the cards and see if they can match them to the fabrics.

Play Find the Fabric

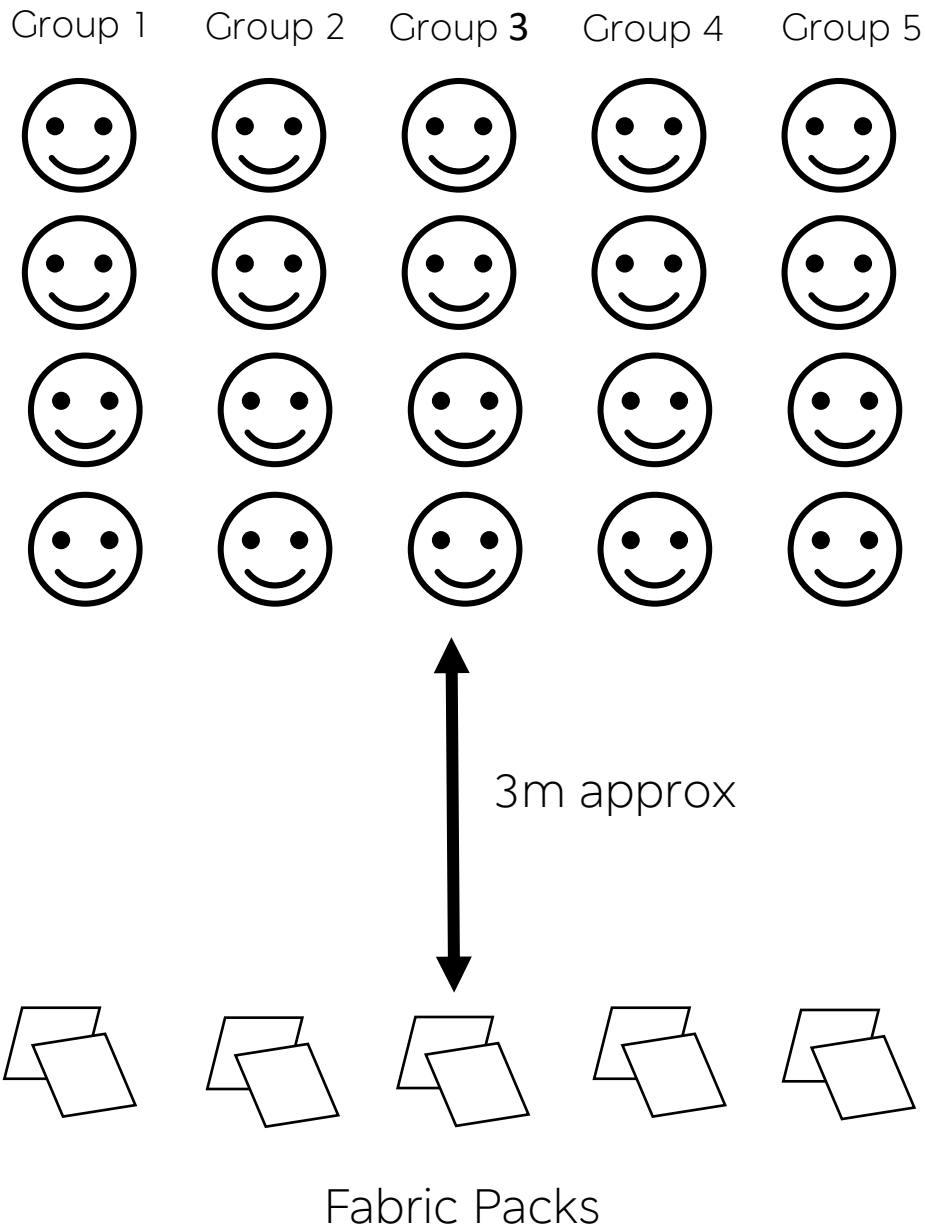
You will need: Fabric Packs, some space to play (see set up diagram overleaf), paper or whiteboard to keep score

- Pupils line up in single file in their groups
- Write the group names on the paper/board
- Place the contents of one fabric pack on the floor about 3m in front of each group (make sure each group understands which fabric pile is theirs)
- Explain that you are going to ask a question, and the answer will be one of the fabrics from the pack (example questions overleaf, tailor these to your fabrics and pupils)
- The pupils at the front of the lines need to race to the fabric piles, find the correct fabric and hold it up in the air and keep holding it up until you tell them to put it down
- The pupil who is first to hold up the right fabric gets 2 points for their team
- All other pupils with the right fabric get 1 point for their team, wrong answers get 0 points
- Tally the scores on the paper/board
- Pupils put the fabric back on their pile and then go to the back of their line
- Repeat with a different question until everyone has had a go, or until you run out of questions!
- Add up the scores and see who has won!





Set up the game like this:



Example questions

- Find a fabric that comes from an animal
- Which fabric would you make jeans out of?
- Find a fabric that comes from a plant
- Which fabric would keep you warm?
- Find a man-made fabric
- Find a natural fabric

Testing fabrics

Pupils now know about the different properties of some fabrics.

This is why we use certain fabrics to make different types of clothing.

Testing at M&S

At M&S we make lots of different types of clothes, and we want to make sure that we use the most suitable fabric each time.

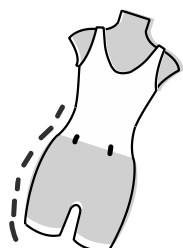
We test fabrics to make sure they have the right properties.

We've been doing this for a long time. M&S set up a laboratory in the 1930s to test fabrics, you can see two scientists working in the laboratory in the picture.

You're going to test some fabrics to find out more about their properties.

Watch the Fabric & Fashion Investigating Fabrics film

We've given details of the two tests in the film on the following pages. You could use these as a starting point for tasking pupils with developing their own questions to investigate and methods of testing.



Investigation 1: Tree-climbing trousers

Slides
9-10

You will need:

For each group – 3 different fabrics e.g. 1 piece of silk, 1 piece of denim, 1 piece of polyester, sanding blocks or sandpaper, pencils, stopwatch/timer, Fabric Investigation Record sheet (included in this pack)

Pupils work in groups.

You need to make some trousers especially for climbing trees.

Q: What properties will your tree-climbing trousers need to have?

A: flexible, strong, thick, comfortable etc

- **Look** at the three fabrics. Make a prediction – which one do you think will be most suitable?

Q: How can you test the fabrics?

Q: How can you make sure your tests are fair? (*see text in italics*)

- Feel the fabrics. Which would be most comfortable to wear?
- How flexible are they? Try to tear the fabrics with your hands, *using the same tearing technique each time.*
- How strong are they? Rub each fabric with the sanding block *for one minute as hard as you can.*
- What happens? Write your results on the Fabric Investigation Record.
- Which fabric is most suitable? Give your reasons. Is this what you predicted?

Investigation 2: Swimsuit

You will need: For each group – 1 piece of wool, 1 piece of denim, 1 piece of elastane/Lycra, bowl of water, measuring jug, pencils, stopwatch/timer, Fabric Investigation sheet (included in this pack)

Pupils work in groups.

You need to make a swimsuit.

Q: What properties will your swimsuit fabric need to have?

A: Light, quick-drying, not soggy (non-absorbent), comfortable

- **Look** at the fabrics. Make a prediction – which one do you think will be most suitable?

Q: How can you test the fabrics?

Q: How can you make sure your tests are fair? (*see text in italics*)

- Feel the fabrics. Which would be most comfortable to swim in?
- Put one of the fabrics into the bowl of water. *Make sure it is completely under the water. Squeeze it under the water three times.*
- *Leave the fabric in the water for 30 seconds.*
- Carefully take the fabric out, *without squeezing*, and then squeeze it over the measuring jug.
- Measure how much water comes out, write it on the Fabric Investigation Record.
- Repeat this with the other fabrics.
- Which fabric is most suitable? Is this what you predicted?

Future Fashion

Q: Do you know what the word innovation means?

A: Inventing something new, or a new way of doing something, that makes the process easier, or solves a problem.

We're going to look at some examples of clothing innovations at M&S and then you can create your own fashion for the future.

Watch the Fabric & Fashion Innovation film.

Summary of film content for teacher information:

Nylon dress: 1950s, synthetic fabric. Low cost, strong, fade-resistant and easy to wash and dry. Made laundry much easier.

Freshfeet: 2000, anti-odour treatment. Antibacterial treatment that stops your feet getting smelly.

Easy Dressing: 2018, clothes for children with additional needs. Tops and coats that open at the front and back, bodysuits with openings for tube feeding, trainers with two zips.

School uniform: Stain and water-resistant technology, non-iron shirts, permanent pleats in trousers and skirts, grow-proof hems. School wear, fleeces and our kids' swimwear contains polyester that is made from 100% recycled plastic bottles!

Future Fashion:

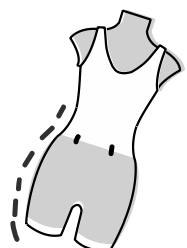
Design innovative clothing

You will need: Future Fashion worksheet, drawing equipment

- **Explain** that pupils are going to invent an innovative piece of clothing.
- **Ask pupils to think about what problem they are going to solve.** This could be something practical like making it easier to get dressed in the morning or a perfect swimming outfit.
 - Alternatively you could think about living on another planet, or in a different environment and what sort of clothing you would need.
- **Ask pupils to think about what properties the clothing would need to have** e.g. waterproof, sun proof, gets you dressed automatically, wifi, light-up etc.
- **Pupils draw their clothing on the worksheet** and label the different features. There is also space for them to explain the problem they will be solving.

Extension ideas

- Pupils could modify existing clothing to give it a new function.



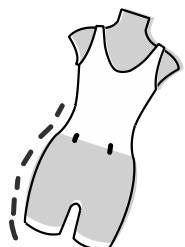
Future Fashion Gallery

You will need: Finished Future Fashion worksheets, display space

Create a display of your finished designs. This could be a physical and/or virtual display.

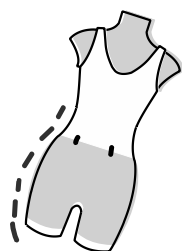
Display ideas:

- Pupils could make life-size drawings of their designs
- Use animation software to animate or make gifs of the designs
- Pupils could evaluate their own work, adding 'new' features or creating a 'new and improved' version of their design
- Pupils could create an advert for their, or someone else's, design

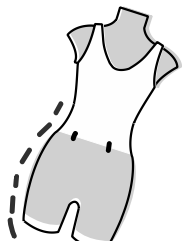


Fabrics: Background information

Fabric	Origin	Process	Properties	Applications
Silk	<p>Cocoons of the mulberry silkworm.</p> <p>To produce 1 kg of silk, 104 kg of mulberry leaves must be eaten by 3000 silkworms.</p> <p>It takes about 5000 silkworms to make a pure silk kimono.</p>	<p>Silkworms are grown on Mulberry leaves.</p> <p>The worms start making their cocoons, which are dissolved in boiling water to get the long fibres.</p>	<p>Shimmery - Silk fibres are triangular, so they reflect light at different angles giving the appearance of different colours.</p> <p>Smooth, soft texture that is not slippery or stretchy.</p> <p>One of the strongest natural fibres.</p> <p>Silk is cool in hot weather and warm in cold weather as it's good at trapping warm air.</p>	<p>It is often used for clothing such as ties, dresses pyjamas and dressing gowns.</p> <p>Silk has had lots of other uses, such as for parachutes, duvet filling and gunpowder bags.</p> <p>M&S sold Artificial Silk in the 1930s to provide an affordable alternative.</p>
<p>Polyester</p> <p>See also Nylon</p>	<p>Produced by large chemical companies.</p>	<p>Created through a chemical process.</p>	<p>Improved wrinkle resistance, durability and high colour retention.</p> <p>Changes shape when heated.</p> <p>Low water absorption and minimal shrinkage in comparison with other industrial fibres.</p>	<p>Polyester is used in clothing and furnishings, bed sheets, blankets, pillows, duvets and upholstery padding.</p> <p>Industrial polyester is used in cars, conveyor belts, safety belts.</p>

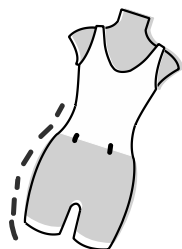


Fabrics: Background information

Fabric	Origin	Process	Properties	Applications
Wool	<p>From animals: cashmere and mohair from goats, angora from rabbits.</p> <p>Very old, used 3500 yrs ago.</p> <p>Synthetic versions eg M&S Orlon (1958) created to be washable and more affordable.</p>	<p>Shearing, scouring (cleaning).</p> <p>Carding, combing, spinning, knitting/weaving.</p>	<p>Wool is easy to spin because the fibres attach to each other and stay together.</p> <p>Warm.</p> <p>Very absorbent.</p> <p>Can be mixed with other fibres to make eg washable wool.</p>	<p>As well as everyday clothing, wool is used for garments for firefighters and soldiers.</p> <p>Washable wools are created by treating wool with chemicals.</p>
Cotton	<p>Soft, fluffy fibre that grows in a boll, or protective capsule, around the seeds of cotton plants.</p> <p>Cotton is grown in Brazil; Sudan; China; Pakistan; Turkey; Mexico; USA; Egypt; Tanzania; India; Zambia.</p>	<p>Picked, cleaned, spun.</p>	<p>Highly absorbent.</p> <p>Can be blended with other fibres to make it more stretchy, or more durable.</p> <p>Is susceptible to pests and over exposure to sunlight.</p>	<p>Use of cotton for fabric is known to date to prehistoric times.</p> <p>Many and varied applications including towels, denim, socks, underwear, yarn for knitting</p>
Denim	<p>Made from cotton.</p> <p>Denim originated in the French city of Nimes. It was called Serge de Nimes (cloth of Nimes), which has become Denim. Jeans were invented in the 1870s when a tailor was asked to make a pair of durable and strong trousers suitable for chopping wood.</p>	<p>Woven cotton twill, woven in a special way to give very tough fabric.</p>	<p>Softens with age.</p> <p>Very tough and durable.</p> <p>Warm.</p> <p>Absorbent.</p>	<p>Jeans! Many other types of clothing and accessories, and even for covering furniture.</p> 

Fabrics: Background information

Fabric	Origin	Process	Properties	Applications
Fleece	Synthetic fibres – M&S fleece is made from recycled plastic bottles.	Made in a factory through an industrial process.	<p>Light and strong. Like wool but much lighter.</p> <p>Soft and easy to wash.</p> <p>Doesn't get waterlogged, very warm.</p> <p>Flammable.</p>	Casual jackets, hats, jumpers, blankets, and outdoor clothing. Alternative to wool.
Elastane/ Lycra/ Spandex	In the early 1950s a stretchy fibre that could withstand high temperatures was invented. After nearly a decade of research the fibre – elastane - was perfected in 1959.	Created through a chemical process.	Very stretchy, returns to original shape after stretching, non-absorbent.	Swimwear, fitness clothing, trousers, jeans and many other clothing uses.





Useful information

M&S Company Archive Schools

<https://marksintime.marksandspencer.com/schools>

M&S Company Archive with My Learning

<https://mylearning.org/collections/the-mands-company-archive>

Contact us

Company.archive@marks-and-spencer.com

