



Taking a Close Look at Microfibres: Teachers' Guide and Learners' Activities

Verity Jones, Luci Gorell Barnes, Margarida Sargo, Ben Williams

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Teachers' Guide and Learners' Activities

This guide shares ten lesson ideas for 7-11 year olds based on themes from the book 'Taking a Close Look at Microfibres'.

An electronic version of the book 'Taking a Close Look at Microfibres' is available at: [XXXXXXXXXX](#)

A limited supply of hard copies is also available. Please contact Verity6.Jones@uwe.ac.uk to make a request or find out more information about the project.

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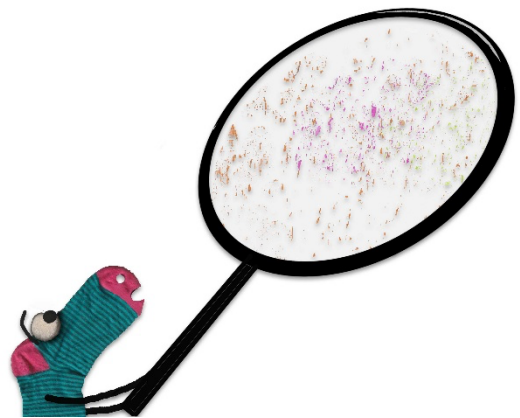
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1: What Are Microfibres?

Investigate what microfibres are and explore the language surrounding them.

National Curriculum Links and Key Stage:

- Geography (KS2): Human and physical geography – understanding how materials and pollution affect environments
- English (KS2): Vocabulary building, explanation texts



Resources Needed:

- Microfibres book
- Paper and pencils

Activity :

Read the book *Microfibres* (whole class, shared, paired or independent). Identify key words and ideas to define microfibres. Create a class glossary (e.g. fibre, shed, microfibre). Pupils draw and label how microfibres are shed from clothing.

Differentiation:

- KS1: Use sorting cards (with images of various natural and synthetic fibres)
- KS2: Create a fact file or short report

Extension:

Search for other books on microplastics. Compare messages and impacts. Use resources like Books for Topics – Plastic Pollution.

2: Design a Poster – “Wear It Longer!”

Design a poster to persuade specific groups of people to think differently about their clothes and work towards making clothes last longer!



National Curriculum Links and Key Stage:

- Geography (KS2): Human geography – impact of consumer choices on the environment
- PSHE (KS2): Living in the wider world

Resources Needed:

- Paper
- Art materials (pens, pencils, paints)

Activity:

Design a poster campaign encouraging people to wear clothes longer. Decide who the audience is and how messages might be different for different audiences. Think about colour, font, size and language that is most appropriate. Make up and / or gather slogans like “Wear It 30 Times”, “Wash it Less” and highlight environmental and social impacts of fast fashion.

Luci Gorell Barnes – the illustrator of *Taking a Close Look at Microfibres* - used collage, working with recycled fabrics, paper, card and plastic that we know shed microfibres. Consider the materials you might use for your poster and how you might be able to repurpose them. What are they made from and what fibres might they shed?

Differentiation:

- KS1: Use templates and sentence starters
- KS2: Include persuasive language and statistics

Extension:

Explore activism in art using AccessArt’s Print & Activism. Introduce artists like Luba Lukova, Faith Ringgold, and Shepard Fairey.

3: Data Detectives

The team who put together the Taking a Close Look at Microfibres did research with schools about the microfibres they found in different classes and rooms around their schools. This project was called Schools Under the Microscope and showed that in a 1m^2 an amazing between 78,000 and 149,000 microfibres land every day. Explore what this might look like and how you can calculate large numbers in small spaces by using grains of rice or counters.

National Curriculum Links and Key Stage:

- Geography (KS2): Geographical skills – interpreting data related to environmental impact
- Computing (KS2): Data handling
- Maths (KS2): Estimation and measurement

Resources Needed:

- Measuring tape
- Rice or counters
- Quadrat (optional)

Activity:

Share with the learners that from the Schools Under the Microscope project between 78,000 and 149,000 microfibres drop in every m^2 every day in schools.

Estimate how many people fit in 1m^2 . Make an estimation of how many rice grains would fit in the same space.

Explore the difficulties of finding out how many grains of rice would fit in 1m^2 . Support learners to find out how many grains in a 1cm^2 and scale up.

Differentiation:

- KS1: Observe and draw
- KS2: Record in tables and graphs

Extension:

Calculate area of classroom or playground and estimate total microfibre coverage.

4: Where Do Microfibres Come From?

With an ever growing global clothing industry, more and more microfibres are shed every day. This happens at every stage of the supply chain - from the cotton farm to your bedroom floor.

National Curriculum Links and Key Stage:

- Geography (KS2): Human and physical geography – global supply chains and environmental impact
- Science (KS2): Everyday materials

Resources Needed:

- World map
- Paper and pencils

Activity:

Invite young people to look at their clothing tags for where their garments were made (usually found in the left side of the garment). Reflect on the journey it might have made.

Now explore the journey of a cotton t-shirt using Planet Money Makes a T-Shirt. Label countries and transport routes on a map and consider where fibres may be their highest and lowest.

[Planet Money Makes A T-Shirt](#)

Differentiation:

- KS1: Match clothes to countries
- KS2: Create a supply chain map with environmental notes. Carbon foot printing based on length of journey could be calculated with the help of websites such as [carbonfootprint.com](#) - [Carbon Footprint Calculator](#)

Extension:

Create a “passport” for the t-shirt with stamps and facts for each country.

5: Debate – Fast Fashion vs. Sustainable Fashion

Talking about the challenges and opportunities for disrupting the cycle of fast fashion provides a great opportunity to develop persuasive, oracy skills and explore supply chains from different perspectives.



National Curriculum Links and Key Stage:

- Geography (KS2): Human geography – economic activity and sustainability
- PSHE/Citizenship (KS2): Rights and responsibilities

Resources Needed:

- Debate prompt cards
- Whiteboard or flipchart

Activity:

Hold a class debate on fast fashion. Discuss pros and cons, environmental impact, and alternatives.

Prompts might include:

1. “We should only buy clothes made in the UK.”
Explore ideas around local production, global trade, and fairness.
2. “Fast fashion does more harm than good.”
Encourages discussion on affordability vs. environmental and ethical concerns.
3. “Everyone should learn how to sew and repair their clothes.”
Links to sustainability, life skills, and reducing waste.
4. “Wearing second-hand clothes should be the new normal.”
Challenges stigma and promotes circular economy thinking.
5. “Clothes should have labels showing their environmental impact.”
Connects to informed consumer choices and transparency.
6. “We should ban synthetic fabrics like polyester.”
Promotes discussion on practicality, pollution, and alternatives.
7. “Children can make a big difference in reducing microfibre pollution.”
Empowers pupils to think about their own actions and influence.
8. “It’s better to have fewer clothes that last longer.”
Explores quality vs. quantity and mindful consumption.
9. “Fashion should be about creativity, not trends.”
Encourages individuality and reduces pressure to buy new things.

10. “Schools should have a uniform made from sustainable materials.”

Links to real-life application and school policy debates.

Differentiation:

- KS1: Role-play with sentence starters
- KS2: Prepare arguments and rebuttals

Extension:

Write a persuasive letter to a clothing company or local MP.

6: Clothing Timeline

Ever wondered when people started making clothes? Or where the first pair of pants came from? Explore a timeline of textiles to answer some questions!

National Curriculum Links and Key Stage:

- Geography (KS2): Human geography – changes in trade and materials over time
- DT (KS2): Textiles

Resources Needed:

- Timeline template
- Fabric samples or images

Activity:

Create a timeline showing how clothing materials and production have changed over time, with the increase use of more synthetic fibres. Dates may include those in in table 1.

Table 1: Example of dates and events about the evolution of clothing fibres.

Date/Period	Event	Notes for Pupils
c. 3000 BCE	Linen used in Ancient Egypt	Made from flax plants; used for wrapping mummies and clothing.
c. 2000 BCE	Silk production begins in China	Silk Road trade begins; silk becomes a luxury item.
c. 1000 CE	Wool widely used in Europe	Sheep farming expands; wool becomes a major trade item.
1700s	Cotton imported to Britain from India	Links to transatlantic trade and industrialisation.
1764	Spinning Jenny invented by James Hargreaves in Lancashire, England	Speeds up cotton spinning; part of the Industrial Revolution.
1800s	Synthetic dyes developed in Germany (1856, William Henry Perkin)	Makes colourful clothing cheaper and more accessible.
1935	Nylon invented in USA by Wallace Carothers of DuPont	First fully synthetic fibre; used in stockings and parachutes.
1970s	Polyester becomes popular globally	Cheap and durable, polyester sheds microfibres that increases environmental impact
2000s	Fast fashion boom with millions of garments being made in China and Bangladesh	Clothes become cheaper and more disposable. See the work of Stella McCartney and Orsola de Castro for a focus on recycling and ethical production.
2020s	Sustainable fashion movement grows	Focus on recycling, upcycling, and reducing waste.

Differentiation:

- KS1: Focus on past vs present
- KS2: Include industrial revolution and synthetic fibres

Extension:

Research how clothing has changed in different cultures or climates.

7: Washing Machine Investigations



Many young people are aware that there are microplastics in the oceans, but how did they get there? Every full load of washing can release up to 70,000 microfibrils into waterways. Due to fabrics having synthetic fibres many of these can be microplastic!

National Curriculum Links and Key Stage:

- Geography (KS2): Physical geography – water systems and pollution pathways
- DT (KS2): Design, make, evaluate

Resources Needed:

- Sieves, filter paper, water, fabric scraps
- Plastic bottles or containers

Activity:

Explore how washing releases microfibrils. Design and test a simple filter using classroom materials. Follow Brian Cox School Experiments from the Royal Society [plastics-resources.pdf](https://www.royalsocietypublishing.org/doi/10.1098/rsos.180000)

Differentiation:

- KS1: Use sieves and observe
- KS2: Design and test a prototype

Extension:

Research real-world solutions like microfibre-catching laundry bags such as [GUPPYFRIEND | Washing Bag - GUPPYFRIEND.com](https://www.guppyfriend.com/) or a microplastic filter to add on to washing machines [Gulp: Microplastic Filter](#).

8: Sock Puppet Stories



The two main characters in *Taking a Close Look at Microfibres* are socks. Creating sock puppets is a great way of reusing clothing, developing design skills and supporting critical communication skills through script writing.

National Curriculum Links and Key Stage:

- Geography (KS2): Place knowledge – linking clothing origins to global locations
- Drama (KS2): Performance
- Art (KS2): Textiles

Resources Needed:

- Odd socks
- Craft materials (googly eyes, glue, felt)

Activity:

Make sock puppets and create a short play about microfibres. Explore how they travel and how people can help.

Differentiation:

- KS1: Use guided questions and simple dialogue
- KS2: Write scripts and perform in groups

Extension:

Develop mending skills. Teach learners how to sew a button onto a scrap of fabric, before extending this to sewing on buttons to socks instead of gluing googly eyes.

Film the performances and share with another class or parents.

9: Fabric Detectives

We are surrounded by all sorts of things, many of which we may have taken for granted and never considered what they are made from, where are they made, how and by whom? This activity provides opportunity to become a super fabric sleuth.

National Curriculum Links and Key Stage:

- Geography (KS2): Local environment – identifying materials in the classroom and their origins
- Art (KS2): Textiles, observational drawing
- Geography (KS2): Local environment

Resources Needed:

- Fabric samples or classroom items
- Paper and crayons

Activity:

Investigate what classroom items are made of. Explore what they are made from and where the raw materials originate from. Who is involved in their manufacture? Create a fabric collage or texture rubbing artwork to showcase what you have learned.

Differentiation:

- KS1: Match items to materials
- KS2: Record findings in a table and write observations

Extension:

Create a classroom “material map” showing where different fabrics are found.

10: Hidden Figures

This activity invites learners to think about who is and has been involved in the development of air quality research and microscopy and celebrates the work of underrepresented groups in these important fields.

National Curriculum Links and Key Stage:

- Science (KS2): Working scientifically, scientists in different cultures
- Geography (KS2): place knowledge (how time and place influences opportunity)
- History (KS2): Significant individuals in science
- English (KS2): Biographical writing, comprehension
- PSHE (KS2): Respect for diversity and equality

Resources Needed:

- Paper, pencils, coloured pens
- Access to tablets or computers

Activity:

Introduce pupils to lesser-known scientists and engineers from underrepresented groups who have contributed to air quality research and microscopy. See table 2 for an example.

Pupils choose one figure to explore. They create a “Science Spotlight” poster or biography or fact sheet with a portrait and why their work matters.

Differentiation:

- KS1: Use pre-written fact cards with sentence starters and drawing templates
- KS2: Pupils present to the class

Extension:

Create a classroom “Wall of Hidden Figures.” Discuss why some people’s contributions are less well known and how we can make science more inclusive and representative.

Table 2: example of scientist and engineers from underrepresented groups

Name	Area of Expertise	Underrepresented Group	Link to Microfibres
Dr. Mona Hanna-Attisha	Environmental health, paediatrics	Iraqi-American, woman	Exposed lead pollution in Flint, Michigan—demonstrates how invisible pollutants affect children.
Dr. Tyrone Hayes	Endocrine disruption, toxicology	African-American, male	Studies effects of pollutants (e.g. atrazine) on amphibians—parallels with microfibre exposure.
Dr. Rosalind Franklin	X-ray crystallography, microscopy	British, Jewish, woman	Pioneered microscopic imaging—connects to how microfibres are visualised in the classroom.
Dr. Carolina Vera	Climate science, atmospheric physics	Argentinian, woman	Works on air quality and climate modelling—relevant to airborne microfibre dispersion.
Dr. Aradhna Tripathi	Climate geochemistry	South Asian-American, woman	Studies climate change and environmental systems—supports understanding of pollution pathways.
Dr. Temple Grandin	Animal science, design	Autistic, woman	Advocates for neurodiversity in science—models inclusive participation in environmental science.
Dr. Chanda Prescod-Weinstein	Theoretical physics, science equity	Black, queer, Jewish woman	Advocates for inclusive science—supports the project's ethos of diverse participation.

