

MARINE
CONSERVATION
SOCIETY

Imogen Napper

Microfibres

Sustainability Goals:



Subject links:

Science, Citizenship, Art,
Design Technology

Ages 7-11

Curriculum key words:

Human impact, modern world, food webs, investigation,
design, environmental responsibility

Ocean Literacy Principles:

6. The ocean and humans are inextricably interconnected

Learning objectives:

- To learn how microfibre pollution can affect animals by exploring food chains
- To conduct an experiment and compare results
- To generate creative ideas for reducing pollution in our environment

Resources provided:

- [Microfibres Fact File](#)
- [Stop Ocean Threads](#) (video)

Extra resources needed:

Bottles, pieces of brightly coloured synthetic material (e.g. polyester, fleece, nylon), filter paper, microscopes and/or magnifying glasses

Step 1

Background

Our clothes are made of millions of tiny fibres, and with every wash, they shed from our clothes and end up in the environment.

Many of our clothes are made from synthetic materials like polyester, nylon or acrylic. These plastic fibres are too small to be filtered out in wastewater treatment plants and subsequently end up being washed into our rivers and seas.

Once they reach the sea, these tiny plastic pieces are easily digested by animals and can build up in the food chain. Consumers, businesses and governments can all help to reduce the number of microfibres ending up in our environment. Find more information in the [fact file](#).

Step 2

Set the Scene

10 minutes – Microplastics

Microplastics are pieces of plastic smaller than 5mm. They can be split into primary microplastics – those that enter the environment this size, like microfibres – and secondary microplastics, which break up over time into small pieces.

Watch the [Stop Ocean Threads video](#) to introduce how microfibres reach the sea. Then, ask pupils to read the label of their uniform. What material is it made from? Synthetic materials, like polyester, nylon or acrylic, are all made from microplastic fibres and can cause problems for our environment when they shed from our clothes.

Step 3

Activities

Activity 1: 30 minutes – Investigation

In this activity, pupils will investigate how washing synthetic materials sheds plastic microfibres.

Split the class into small groups. Each group should have a bottle with a piece of brightly-coloured synthetic material inside like fleece, polyester, or nylon. Each group will also need filter paper and microscope or magnifying glass. Fill the bottle $\frac{3}{4}$ full of water and have each person take it in turns to shake it for 30 seconds. Filter the water into another container through the filter paper, and analyse the paper using the magnifying glass or microscope. Pupils should now be able to see small fibres released from the material.

To complete the investigation, students could write up their method and what they found out. Refer to the [video](#) and discuss how this investigation links to the need to install filters in washing machines.

Activity 2: 20 minutes – Creative campaigning

In their groups, ask pupils to reflect on what they've learned about microfibre pollution and generate some ideas for a creative campaign to help reduce it.

They could run a repair workshop to bring new life to old clothes; organise a clothes swap to promote second-hand shopping; design posters to raise awareness; or develop a reuse shop for school uniforms. It's up to you!

Plan out your campaign as a class and start taking action on microfibre pollution.

Step 4

Extend

1 hour – Learn to sew

Being able to repair clothes rather than buying new ones helps reduce the amount of clothing waste being produced and microfibres released into the environment. Remember: new clothes are the worst culprits, as the first few washes release the most microfibres!

Giving old clothes a new look is a great way to keep them interesting and reduce the urge to buy new ones. Challenge students to practise stitching and sewing with the aim of repairing an item of clothing at home. Are there any parents or guardians who could help run a workshop for them?

Step 5

Reflect

5 minutes

What are microfibres? How can animals be impacted by microplastics? Explain one way we can help to reduce microfibre pollution.

Step 6

Follow up

Learn more about other kinds of ocean pollution in our [Source to sea](#) lesson.

To explore other creative ways of raising awareness and campaigning for change, check out our [Activism](#) resource.

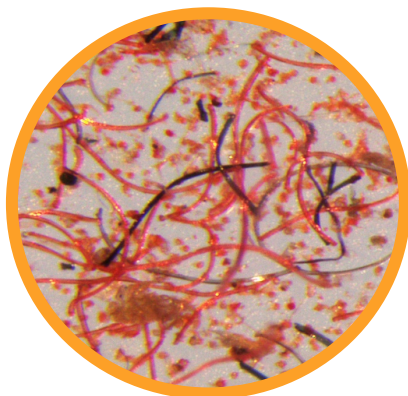
Microfibre Fact File



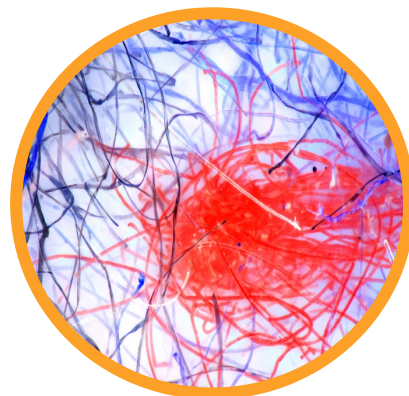
The problem

Our clothes are made of millions of tiny fibres. Often these are synthetic, or non-natural, materials like polyester, nylon or acrylic, which are made from plastic fibres. With every wash and wear, these microfibres shed from our clothes and can reach the sea.

- A single wash can release over 700,000 microfibres, and it's estimated that every week in the UK 9.4 trillion fibres are released from washing clothes (1)
- The fibres enter wastewater through drains, and many are then released into rivers and ultimately our ocean
- Sewage sludge from our wastewater treatment plants (that's where your water goes when you flush the toilet!) is a valuable source of nutrients for farmers as a soil fertiliser. However, this sludge contains microfibres captured from our wastewater. Rainwater can then wash these fibres from fields into rivers and ultimately the ocean
- 35% of primary microplastics found in the environment come from washing synthetic clothes (2)
- Once they reach the ocean, microfibres can be ingested by marine animals and the plastic can build up in the food chain over time. Microplastics have been found in many species of seafood we eat, including clams, mussels, fish and shrimp. One study found 63% of shrimp in the North Sea contained synthetic fibres! (3)



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Microfibre Fact File



The solution

The best way to stop the flow of microfibres into our ocean is to fit filters in washing machines. The filters would be internally fitted in domestic and commercial washing machines and would capture microfibres in the same way that lint is caught in tumble driers, tackling pollution at source.

What businesses can do

Clothes shed the most microfibres during the first few washes, including any washing that takes place during the manufacturing process. We want to see commercial business, like manufacturers, laundrettes and hotels, fit microfibre filters on existing washing machines to help reduce this kind of pollution.

What the government can do

In 2023, the Marine Conservation Society handed in a petition to the UK Government with over 44,000 signatures calling for the introduction of microfibre filters, by law, for washing machines by 2025. Follow the [Stop Ocean Threads](#) campaign on our website for updates.

What you can do

- Check clothing labels. The worst microplastic-shedding fabrics are polyester, fleece and nylon. Choose clothes made from as near to 100% natural materials as possible to help reduce plastic pollution
- Reduce fast fashion consumption. It's estimated that we are buying 60% more clothes than we were in 2000. To reduce how much you buy, repair clothes that need fixing, shop second-hand and swap clothes with friends and family (4)
- Wash clothes less frequently to reduce the fibres shed and make them last longer. Stick to lower temperatures, shorter cycles and always wash in full loads
- Use liquid detergent instead of abrasive washing powder, as this loosens more microfibres, and use fabric softener. Fabric softener has been found to reduce the number of fibres shed by more than 35% (5)