

11–14 years

# Toxic socks character cards



# Grandparent: Jan

**Background:** I wouldn't like to cause damage to the environment because I bought socks containing silver particles that washed out. But people have been buying products to fight foot odour for years without problems. Why would this be any different?



**Fact:** As you get older it gets harder to look after your feet and they can get smelly.

**Issue:** Silver particles kill bacteria and might cause big problems if they get released into the environment.

**Question:** Surely, these socks must be safe or we wouldn't be able to buy them?

# Water treatment executive: Dr Foster

**Background:** I am a senior water treatment engineer. We monitor and control the process that takes untreated water from rivers or ground water into the treatment plant to make it safe to drink.



**Fact:** We have known since the Middle Ages that silver is toxic and anything that increases the amount of silver in the environment is going to be problematic.

**Issue:** Increased silver concentrations could harm the bacteria used in water treatment facilities to process waste.

**Question:** If we harm the bacteria used in water treatment, we could make it harder to clean water which will reduce supply. Are socks worth this risk?

# Teenager: Sol

**Background:** Technology keeps improving our lives. Imagine if we didn't have cars? The whole reason silver nanoparticles are used is because silver kills the bacteria that cause foot odour. The amount of silver must be really small or the socks would be really expensive. I don't see how such a small amount can be a problem.



**Fact:** If those nanoparticles are released into the environment you no longer have any control over what, if anything, they affect.

**Issue:** Silver kills bacteria and could damage aquatic ecosystems.

**Question:** Why don't they just filter the nanoparticles out of the water?

# Teenager: Bobby

**Background:** I think consumers need more information about the products they buy. A lot of people don't know what nanotechnology is, but they are out there buying products with nanoparticles in them.



**Fact:** We do not know what the long-term effects of nanotechnology will be on the environment.

**Issue:** If the public doesn't know the possible environmental disadvantages of using these nanomaterials, they cannot make an informed decision on whether to buy a product containing nanomaterials.

**Question:** Why not put more information on clothing labels, a bit like food packaging? That way we can make up our own minds about what we are happy with.



# Sportswear development researcher: Dr Smith

**Background:** I am part of a team of scientists committed to advancing sportswear to improve performance. Foot odour is embarrassing and uncomfortable. The intense smell commonly results from bacterial action upon sweat which accumulates due to confining footwear. Warm moist conditions encourage microorganisms to grow which may lead to foot problems that affect an athlete's performance.



**Fact:** Pitted keratolysis is a bacterial skin infection that causes crater-like pits and a bad smell.

**Issue:** The infection can cause itching and make walking painful.

**Question:** Isn't it our duty to help prevent people from having to suffer from embarrassing and painful infections?

# Green chemistry researcher: Dr Benn

**Background:** Research suggests that the particles, intended to prevent foot odour, could travel through a wastewater treatment system and enter natural waterways where they might have unwanted effects on aquatic organisms living in the water and possibly humans, too.



**Fact:** When it comes to nanoparticles, their size is what gives them their special properties.

**Issue:** Silver nanoparticles have longer-lasting antibacterial properties than bigger particles of silver.

**Question:** Is it right to sell products to the general public if we have no idea what the long-term effects might be?

# Athlete: Stevie

**Background:** Taking off your shoes at the end of a long day feels great. Having smelly feet can make you wonder what's causing the odour and if it's a sign of an underlying health issue. As an athlete, I try to look after my body and don't want to risk using potentially dangerous products even if they are only socks.



**Fact:** Most silver nanoparticles are toxic to the human body, and it is precisely because of their small particle size that they can penetrate human tissues.

**Issue:** Nanosilver may cause skin irritations. It can be inhaled and affect the lungs and liver. Nanosilver may also damage genetic information.

**Question:** In the 1930s and 40s people thought smoking was good for you. Could we be making a similar mistake with nanotechnology?



## Parent: Ross

**Background:** It is difficult for a young person who suffers from foot odour or any other embarrassing problem that could draw negative attention towards them. Foot odour can affect people's confidence to go out, socialise or even go to school.



**Fact:** Foot odour is a common problem because feet sweat more than other parts of the body. Sweat and bacteria go hand-in-hand, producing unpleasant odour that lingers in your shoes and on your feet.

**Issue:** People notice it and comment on unpleasant odours. It's embarrassing.

**Question:** Because of the concerns about nanosilver socks, should only people with foot odour problems be able to buy them?

# Acknowledgements

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