

Nanoscience

MAGS Nanoscience is the study of particles between 1 and 100 nanometres wide – nano-scale particles. 1 nanometre is one-billionth of a metre. That's way smaller than a grain of sand, tinier than the cells in our bodies, more miniscule than bacteria. You can't even see them with a microscope.

Nanoscience is amazing. The properties of the same material in its bulk form can change entirely when it's in its nano-sized form. Nano-scale particles have a huge surface area to volume ratio which makes them really useful.

CAL Useful for what?

MAGS Well, the potential use of nanoscience in the future is actually huge. Nano-scale particles can be used to make medicines more effective, for lighter, stronger building materials and to produce miniature electric circuits using nanotubes.

CAL Sounds like science fiction to me.

MAGS It's not science fiction, it's nanoscience. This isn't just about the future either – nano-scale particles are already here. Nano-sized silver particles are used for their anti-bacterial, anti-fungal and anti-viral properties in things like antiseptic sprays, plasters and deodorants. Not in yours though, eh?

CAL I'm not sure I want nano-sized particles in my body – sounds risky to me. If nano-sized particles are smaller than our body cells, they must be easily inhaled and absorbed into our bodies, and into our environment. Surely, there have to be consequences?

MAGS Well, the technology has been tested and proven safe in the short term but it's still relatively new, so no one really knows what might happen in the long term.

CAL Don't some sunscreens have nano-scale particles in?

MAGS Spot on. They use titanium dioxide nano-scale particles which protect our skin by absorbing and reflecting UV light. They're also transparent so no white streaks like your old-fashioned sunblock.

Bitesize

- CAL I think I'll stick with the classic for now. I guess it doesn't hurt to be cautious about using nano-scale particles on our bodies until we know more.
- MAGS Fair enough. Nano-scale titanium dioxide isn't just used in sunscreens, though – it's also used in self-cleaning glass. It reacts with daylight to break down dirt and make water spread out evenly rather than in droplets – the water runs off without leaving any streaks.
- CAL Bulk quantities of titanium dioxide wouldn't be able to do that, and a lump of silver isn't anti-bacterial.
- MAGS Yeah. It's only when it's used in nano-sized particles that it has those different properties.
- CAL So putting a silver spoon in your socks won't stop your feet from stinking.