

Wheel of Fortune – Question Topics

Cutting it Down to Nano
Ferrofluid
Forms of Carbon
Light Emitting Diodes
Liquid Crystals
Magic Sand
Nanosurfaces/Lotus Effect
Probe Microscopy

Cutting it Down to Nano:

Q: Can you see something that is one nanometer with your eyes?

A: *No.*

Q: Does nano mean one millionth, one billionth or one trillionth?

A: *One billionth.*

Q: Why do scientists need special tools to work at the nanoscale?

A: *The nanoscale is so small that special tools are needed to see and work at that scale.*

Ferrofluid:

Q: What size are the magnetic particles in Ferrofluids?

A: *Nanosize*

Q: What are ferrofluid nanoparticles made of?

A: *Magnetite, Iron, Iron oxide. (all acceptable)*

Q: What keeps the nanoparticles in ferrofluid from sticking together?

A: *A surfactant/oily layer coats the nanoparticle*

Note to Volunteers:

The three questions for each topic are arranged in increasing order of difficulty. The first question is aimed at young kids, the second at middle school and the third at high school and adults.

Have the visitor pick a topic, then use your judgment as to which question to ask based on age and ability.

If the visitor gives an answer that is correct but not the specific answer we are looking for, you can ask a follow up question or ask them to clarify their answer.

Probe Microscopy:

Q: True or False: You can see atoms with your eyes.

A: *False.*

Q: True or False: A scanning probe microscope can be used to image atoms on a surface, but not to move them.

A: *False.*

Q: True or False: A probe microscope works by bouncing light off a surface and magnifying the image.

A: *False.*

Nanosurfaces/Lotus Effect:

Q: Why does water not stick to the surface of the collard leaf?

A: *The textured/bumpy surface.*

Q: What product have scientists made that mimics the lotus effect?

A: *A water-repellant, self-cleaing paint.*

Q: Why are lotus leaves self-cleaning?

A: *Dirt particles are too big to get between the surface bumps, and get swept away with water.*

Magic Sand:

Q: What is the difference between regular and magic sand?

A: *Regular sand soaks up water, magic sand pushes it away.*

Q: Why does the coating on magic sand repel water?

A: *It is an oil-like/hydrophobic layer.*

Q: Define hydrophobic.

A: *Afraid of water or water-repellant.*

Forms of Carbon:

Q: What are four forms of Carbon?

A: *Graphite, diamond, buckball/fullerene, nanotube.*

Q: Which two forms of carbon can conduct electricity?

A: *Graphite and nanotubes.*

Q: Why do graphite and diamond have different properties even though they are both made of carbon?

A: *Their structures/bonding are different.*

Liquid crystals:

Q: Name a product that has liquid crystals in it.

A: *Mood rings, TVs, laptops, soap, paint, thermometers, etc.*

Q: Where do liquid crystals fit, in terms of phases of matter?

A: *They have properties in between those of liquids and solids.*

Q: True or False: The molecules in a liquid crystal have random orientations.

A: *False.*