What is nanotechnology?
Nanotechnology is working at the nano-scale to discover new properties of matter and to utilise those properties for new purposes.

Can they make nanorobots that will take over the world?
Not really - to describe how big a nanometre is, first think of a water molecule, that’s two hydrogen atoms and an oxygen atom, they are extremely tightly bonded to each other, and if you want to think how closely they are bound, well the hydrogen and oxygen are about a tenth of a nanometre apart, if you think about how small that is you wouldn’t be able to build robots of that scale and have them really do anything. Tiny robots are more likely on the micro-scale.

What is the most interesting thing about nanotechnology?
I guess the most interesting thing is that there are just so many amazing new properties of matter that we never thought existed, like some metals not conducting electricity and carbon nanotubes conducting it very well, complete opposites to what they would be like on the big scale.

What made you want to study nanotechnology?
Nanotechnology is on the cusp of something big. Many new papers are being released about the fantastical new properties found in nanotechnology and their wonderful new applications; I just wanted to be a part of it all.

Why did you become an In2science Mentor?
I was being selfishly selfless. When I was at high school I had this wonderful teacher who had an amazing way of teaching us physics that it just made me want to learn more about it. I thought that if I could pass on that enthusiasm that would be a definite win for me, so I volunteered, the selfish part being that I get to have fun and meet new people.
What you need

Sticky tape
Clothes peg
A drinking straw
A couple of Balloons (long thin ones work best)
Long piece of fishing line (or smooth string)

What's happening?

Real rockets work on the principle of propulsion. They burn fuel in their boosters which forces gas down out of a nozzle at the bottom. As the gas is forced downwards there is an equal and opposite force upwards which propels the rocket up.

In your balloon rocket you are not burning fuel but using compressed air. When you blow up a balloon you force air particles into the balloon so they are more squashed together than normal. This makes the air pressure in the balloon high. When you release the clothes peg the air particles rush out to the lower pressure air outside where they are less compressed. As the air rushes out one way, the balloon is pushed the other way and shoots off.

The law that states for every action force there is an equal and opposite reaction force is called Newton’s third law of Motion. It was first explained by Sir Isaac Newton in the year 1686.

Further investigation

What happens to the rocket if you...
Change the type of string? Change the angle (slope) of the string? Use a different balloon?