meet an In2science mentor

Read about Mentor Jesse who is studying Nanotechnology, interviewed by students from partner school Brunswick SC

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.

Nanometre: A billionth of a metre

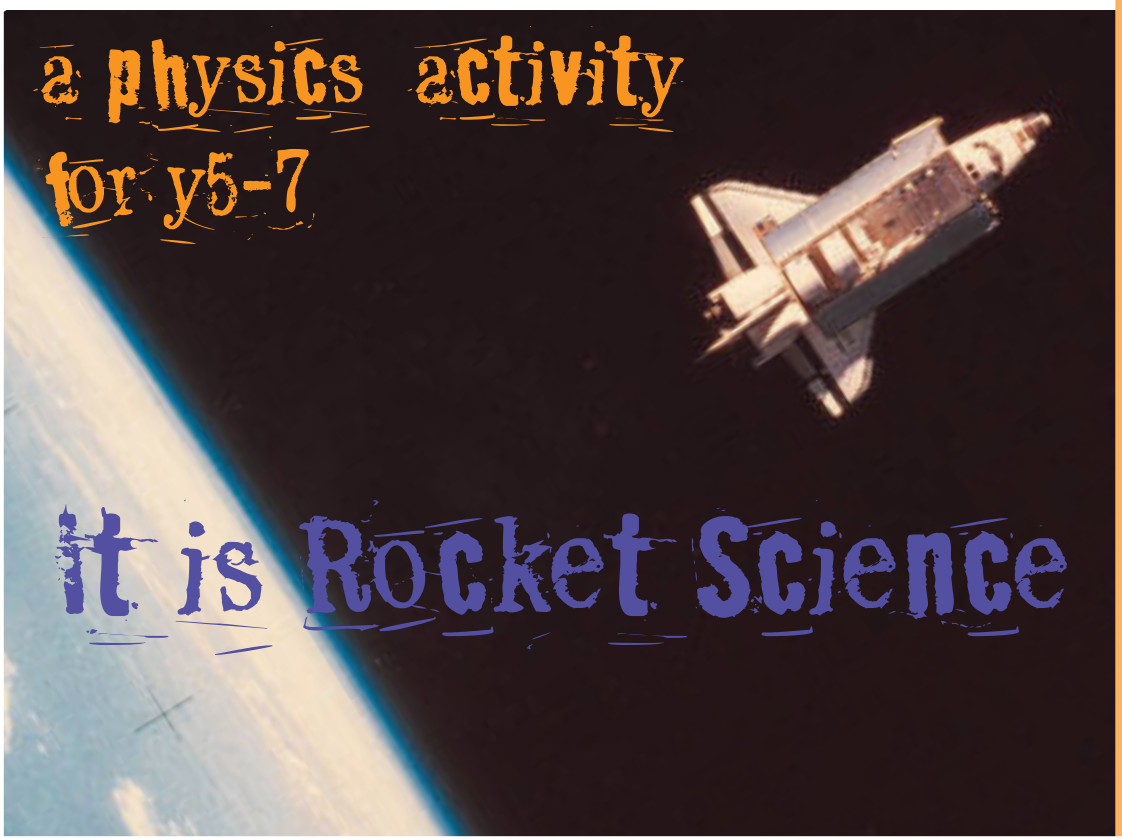
What is the most interesting thing about nanotechnology?
I guess the most interesting thing is that there are just so many amazing new properties of matter that we never thought existed, like some metals not conducting electricity and carbon nanotubes conducting it very well, complete opposites to what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

What made you want to study nanotechology?
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.

www.in2science.org.au

In2science
science peer mentoring in schools



Hello,

This activity is for you to try at home with your child and we hope it is both a fun and rewarding experience. Also included is an interview with one of our Peer Mentors undertaken by students at one of our partner schools.

Have fun!

- The In2science Team

Who are we?
The In2science Peer Mentoring in Schools program places volunteer university students as scientists and mathematicians in the classroom. Their role is to help inspire the next generation by being a role model to them of the importance of science, maths and learning.

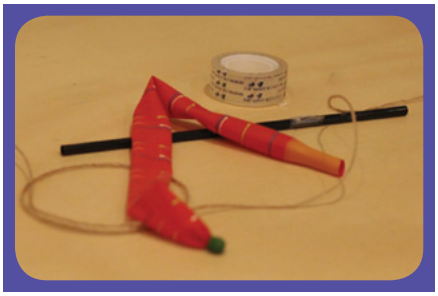
In2science proudly funded by
State Government Victoria Department of Education and Early Childhood Development

It is Rocket Science

aim

Learn about forces while making a balloon rocket

what you need



Sticky tape

Clothes peg

A drinking straw

A couple of Balloons (long thin ones work best)

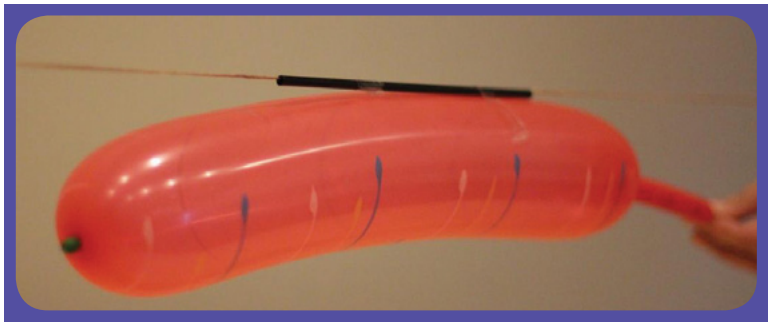
Long piece of fishing line (or smooth string)

instructions

- Tie one end of the fishing line to a door handle at about chest height
- Thread the fishing line through the straw
- Ask someone to hold the other end of the fishing line on the far side of the room so it is tight
- Blow up your balloon and clip the clothes peg on the end to keep the air in (this can be a bit tricky)
- Attach the balloon to the straw with two pieces of sticky tape
- Release the clothes peg and watch the rocket go!

time involved?

Less than 30 minutes



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?