

Technology **handout** for parents

Technology – a smart choice for Years 11-13 is a new Futureintech handout for parents to get them up to speed with Technology as taught in today's schools.

2 Futureintech School survey

In their last three years of secondary school, students have to make critical decisions on subject choice – decisions that will affect the rest of their lives. Research shows that parents have a very strong influence over subject choice of their children, and yet many do not really understand what Technology as a subject can offer and how important the area will be in the future. It is vital that parents have a clear understanding of the nature and opportunities of this relatively new curriculum area.

3 Pickering Lecture Nanotechnology

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Futureintech has therefore developed a two-page handout for teachers and schools to give to parents. *Technology – a smart choice for Years 11-13* explains the importance of technology to society, as a learning area, and as a career option.

With technology now on the 'approved subjects' list for university entrance, this is a very important resource for teachers and careers advisors to hand out to parents – not just for students interested in technology, and science, maths, arts and design, but for all students.

The handout aims to dispel the many misconceptions some parents have about technology, often based on their own experiences at school with metalwork, woodwork, sewing and cooking classes. It explains how today's Technology classes

viable solutions, choose the most appropriate, and then create that solution.

Learning is interactive and teamwork is strongly encouraged. Students learn to work with others, to show initiative, to be creative and to find compromise when required.

Globalisation and technological change are two key features that are changing and shaping our lives. The technology curriculum has now developed to a level that I strongly recommend it as a subject, both to students who have an interest in making a career in engineering, technology or science, and generally as a means of better understanding the modern world.

Professor Bob Hodgson, Director, School of Engineering and Technology Massey University



futureintech
A career in technology, engineering and science

technology
in the classroom

Technology – a smart choice for Years 11-13

So much has changed in primary and secondary school classrooms over the past few years – in what is taught and how it is taught. Nowhere is this change more radical than in the teaching of Technology. This handout aims to answer some of the questions parents frequently ask about this new and exciting learning area.

Technology – isn't that just metalwork and cooking?

Not at all. Technology is a completely new learning area. The world of metalwork and baking sponges that many parents knew at school is as different from the teaching of technology today as a cake is from a computer.

So what do kids do in Technology classes?

Technology explores the entire process of why, what and how we make things. Anything and everything. Technology is taught in a wide range of areas – including soft materials, hard materials, food technology as well as information and communication technology (ICT).

Students work on projects, where they are asked to identify real opportunities and needs, come up with

The facts...

- TECHNOLOGY explores the entire process of why, what and how we make things.
- TECHNOLOGY uniquely merges the practical and academic, teaching essential skills invaluable to high achievement in life, learning and all working situations
- ALL STUDENTS study Technology in Years 1-10.
- IN YEARS 11-13 most secondary schools offer Technology as an option.
- TECHNOLOGY is on the 'approved subjects' list for university entrance.

A technology project could be anything from designing a rabbit hutch at Year 1 to the design and creation of souvenir items with support and advice from Te Papa. Case studies that represent the wide range of Technology projects in schools throughout New Zealand can be found at www.techlink.co.nz

Who is teaching in Technology classes?

The Technology curriculum is now 10 years old and most larger schools have a team of highly experienced specialised technology teachers. Technology is a very exciting and innovative area to teach, attracting teachers who are highly motivated and passionate about a subject that enables them to explore new ways to inspire and engage their students.

In many classes there is a great deal of peer tutoring and mentoring support – within the classroom, within the school from more senior students, and from outside the school, from ex-students and others doing tertiary study and working in industry.

Many schools are bringing industry professionals into the classroom to advise and help manage individual and class projects, through initiatives such as the Futureintech Ambassador scheme – see www.futureintech.co.nz

explore the entire process of why, what and how we make things, and that it is a unique learning area in the ways that it merges the practical and academic. Technology students learn essential skills invaluable to high achievement in life, other learning and all working situations.

For more on what Technology students are doing in and outside the classroom, see pages 2 and 4.

Technology – a smart choice for Years 11-13 is a two-page A4 pdf that can be downloaded and printed, from:

www.futureintech.com/Fit-on-tech.pdf

Tawa first-up in Futureintech survey

Schools that have used Ambassadors are being surveyed to gauge the effectiveness of the initiative, and to find out ways to refine and improve the services Futureintech provides.

Six schools from around New Zealand have been selected for the survey, to ensure that a range of perspectives are considered. Interviews will be done at each school, to get the candid reactions of teachers and students to Futureintech and its Ambassadors.

The first school to be surveyed is Tawa School, which has been using Futureintech for the last two years. The school's technology programme – seven two-week technology modules that each focus on a different field of technology – made it an ideal candidate.

Much of the information for this case study comes from an interview with Tawa School's Deputy Principal Neil Sargisson – Futureintech's contact at the school. He brought the dual perspective of interacting with Futureintech both

as a teacher and an administrator.

He says that teachers who made use of Futureintech Ambassadors in their classrooms were all positive about the experience.

Students were also very positive, and particularly liked the fact that Ambassadors returned for follow-up sessions, which gave them the chance to become more comfortable and more inclined to ask questions as they got to know the Ambassador. It also gave the Ambassador a chance to learn names and further develop projects that the class have worked on since the Ambassador's last visit.

"At the primary school level it's not just about expertise. I'm sure any one of the teachers could go over the Ambassador's notes and work out a lesson plan from it.

"The big advantage of using Ambassadors in the classes is that they enable students to make the connection between what they're studying and how that knowledge is used in the working world.

"It's similar to bringing a police officer in for a DARE seminar. The children pay more attention and trust the validity of what they hear.

"The addition of anecdotal examples makes the whole thing perfect. Kids love it. Instead of simply learning the facts they begin to think about the value of the knowledge and maybe even consider that area of industry as a career."

Hon Trevor Mallard, Minister of Economic Development, visited Tawa school on 9 August to see Futureintech Ambassadors in action first-hand. Mr Mallard spent a morning watching Ambassadors Megan Angell, of Traffic Design Group, and Henry Tatham of Beca support numeracy and mechanics classes. Also in attendance was the local electorate MP and Associate Minister for Economic Development, Winnie Laban.



Nanotechnology of the future

Each year IPENZ Engineers New Zealand commissions a series of free public lectures – the Pickering Lectures – with topics selected to interest a broad range of people, including high school students. This year the lectures covered the exciting new world of nanotechnology.

This year's Pickering Lectures were presented by Mike Treder, Executive Director of the Centre for Responsible Nanotechnology in New York; and Associate Professor Richard Blaikie, lecturer at the University of Canterbury and Deputy Director of the MacDiarmid Institute.

Mike began his lecture by defining nanotechnology as "the engineering of functional systems at the molecular level". He then went on to say that we are on the brink of a new technological age in which nanotechnology will play a key part.

In a matter of decades, he said, nanotechnology will bring about changes that will be equal to all the technology changes that have occurred over the past 200 years.

Nanotechnology uses stronger, lighter materials and produces smaller, faster electronic goods, while using fewer raw materials. It assists energy efficiency, gives us more computing power and produces new medical treatments.

Mike explained the possible positive and negative implications of the technology.

On the positive side nanotechnology is likely to yield medical robots and facilitate the rapid development of 'wondrous' products that dramatically improve quality of life.

On the negative side nanotechnology could be a method of producing untraceable weapons of mass destruction and a "vicious scramble to own everything".

The lectures also featured the New Zealand perspective, where some very exciting nanoscale research is taking place. David Officer, Director of the Nanomaterials Centre at Massey University, is working to increase the efficiency of solar cells. At the University of Canterbury Richard Blaikie is using super lenses to focus on subjects 70 nanometres wide with the aim of using the lenses to fabricate microchips with much finer features.

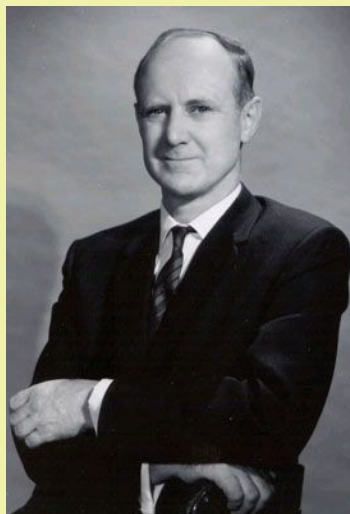
Other topics discussed during the lectures were:

- Nanobioengineering – studying the effects of medical treatments on individual cells
- Detecting single molecules using optics

- Nano cluster devices – such as sensors and transducers
- A hydrogen sensor prototype – likely to have particular application in fuel cells.
- Silicon chips – following Moore's Law, unknowns in the manufacturing process will start to occur in 18 months as conductor widths continue to decrease.
- Optical lithography – silicon chips are made by projecting a large-scale mask onto a light-sensitive wafer, a process limited by the wavelength of the light – lenses produced using nanotechnology could allow more finely detailed tracks to be printed using visible light.

For more about nanotechnology visit the Centre for Responsible Nanotechnology's website, www.crnano.org. Mike Treder's National Radio interview is at 202.7.7.90:7000/sat/sat-20060902-0910-Mike_Treder-048.mp3.

The Pickering Lectures



The Pickering Lectures are named in honour of New Zealand space engineer, Sir William Pickering who died in 2004 at age 93 after a long and illustrious career.

Sir William was a central figure in the US space programme and a former director of the NASA Jet Propulsion Laboratory in California. He was the man responsible for America's first satellite, Explorer 1 in 1958, as well as for Ranger VII - the mission that returned the first pictures of the moon's surface in 1966.

He is one of the few people to have been featured on the cover of Time Magazine twice.

Futureintechnews

NZIFST

Collaboration between Futureintech and the New Zealand Institute of Food Science and Technology continues to produce successful results. NZIFST's website now features a Careers and Education page that is full of useful information and includes more than a few familiar faces from Futureintech.

Food technology is a booming industry and the NZIFST and Futureintech are keen to help interested students take advantage of what a career in Food Technology has to offer.

On the NZIFST site you will find information on careers in food technology along with links to a wide range of information including:

- a full list of food science, technology and engineering **tertiary courses** offered in New Zealand.
- a list of **scholarships** available for food science, technology and engineering studies.
- a list of **job options** which indicate the qualifications you will need. Follow the links to find out what these courses entail, and where to go to study for them in New Zealand.

The NZIFST website careers pages, www.nzifst.org.nz/careers, are essential reading for anyone interested in a career in Food Technology.

Techlink and Beacon Practice

IPENZ currently holds a contract with the Ministry of Education to provide online resource material



One of the Queen Margaret College Year 13 student window displays at Te Papa, to celebrate the Montana World of WearableArt Awards in Wellington in September.

to support the planning and implementation of programmes in technology education, and case studies of classroom practice.

www.futureintech.co.nz

Futureintech's website contains a wealth of information for students, parents, teachers and careers advisors. It has profiles of young people working in technology, engineering and science, and the companies they work for, along with information on different courses, careers and scholarships available.

This resource material is available on the Techlink website, www.techlink.org.nz, and is gathered from schools around New Zealand that have been identified as undertaking beacon practice in technology education. One such school is Wellington's Queen Margaret College.

As a Beacon Practice school Queen Margaret's enjoys extra support for its technology curriculum. The

investment is proving to be well worth it with Year 13 Materials Technology students Sarah Bowerman and Eloise Jack invited to display the results of their major client project in a Te Papa display as part of the World of WearableArt Awards.

The girls worked alongside Jan Morris and Colin McFetridge at Te Papa Store to develop a design brief that met their client's criteria. A main specification for this project was the incorporation of the Te Papa Thumbprint icon into their work.

The girls' Wearable Art displays went up in the Te Papa front windows on Tuesday 19 September 2006 and are on display for two weeks.

Technological practice case studies

The Techlink website, www.techlink.org.nz, is fast expanding with the recent addition of several new case studies on technological practice in New Zealand industry.

On the Techlink site you will find a wealth of information on the realities of work in the technology and engineering sector. Case studies on technological practice follow projects from conception to completion and provide details on all aspects of the work involved; including the highs and the lows.

The site is an excellent way for students to get a taste of what is involved in particular careers, learn from the successes and the mistakes of prominent industry professionals and get a head start on what interests them.