



# MSR Youth

putting young people first

Issue 5 September 2008

New Zealand Association for Intermediate and Middle Schooling

## **(un)Healthy Youth**

**CHALLENGING THE WAY WE THINK**

### ***Feature Articles***

**If the system's not working, replace it!**

**What pushed Peter Snell's buttons?**

**Weak education: There is a better way**



**NZAIMS**

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Publisher: Brian Hinchco PhD  
Papatoetoe Intermediate School  
Auckland, New Zealand  
[brianh@papatoetoeint.school.nz](mailto:brianh@papatoetoeint.school.nz)  
[www.nzaims.co.nz](http://www.nzaims.co.nz), +64 9 278 9763

MSR Publications Committee: Wendy Esera,  
Brian Hinchco PhD (Chairperson), Ross Tyson

Editor: Pat Nolan PhD  
+64 (6) 353 8442, [editor@msr.org.nz](mailto:editor@msr.org.nz)

Deputy Editor: Jan Parsons

Contributing Authors: Terry Crooks, Fiona Farrell,  
Garth Gilmore, Doug McLean, Neryda McNabb, Bill  
Noble, Pat Nolan, Alwyn Poole, Peter Snell, Stephen  
Stannard, Anne Volmuller, Fergus Walsh

Art & Design Direction: Kathy Glentworth

Contributing Photographers:  
Kathy Glentworth, Mark Glentworth, Meridee  
Beange, Whakatane Intermediate School

Production Manager: Andrew Nolan

Production Team: Janine Flanagan, Kushla Mercer

Funds Development Advisor: Adrian Phillips (Ovate  
OBOD)

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MSR Youth Motto

*We are what we repeatedly do. Excellence, therefore,  
is not an act but a habit.* Aristotle - Greek philosopher

MSR Youth actively supports and promotes the aims  
and objectives of NZAIMS. MSR Youth encourages  
readers to refer to the journals of the North American  
and Australian associations that support early  
adolescent development, education and welfare:  
[www.nmsa.org](http://www.nmsa.org);  
<http://www.mysa.org.au/>; and <http://www.ascd.org/>

MSR Youth perspective

The ability of all societies to put young people first  
and give them the best chance in life is a serious  
challenge, globally.

Parents everywhere know that getting it right is  
critical, while their children grow and develop as  
young persons, and as future citizens.

Professionals in a wide range of sectors connected to  
education all have a vested interest too in the process  
and the outcomes. They include health and welfare,  
the judiciary, sport and recreation, economic and  
social development and the environment.

MSR Youth provides a forum for debate that includes  
everyone. It fosters evidence based developments and  
reports research and exemplary practices that support  
the development, education and welfare of young  
people across all sectors.

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# If the system's not working, replace it!



## Can we rise to the 21st Century challenge?

Pat Nolan

The statistics are appalling and the outcomes tragic <sup>1</sup>: thousands of New Zealand youth are incarcerated in prisons, on parole or classified as being a social security risk. Many more may be on the brink of offending and more still alienated from school and society. Yet, youth in great numbers succeed at school; and they look forward to participating actively and contributing responsibly in society beyond school.

In this Issue 5 of MSR Youth, at least two authors, the NZAIMS President, Bill Noble, and Principal Doug McLean, argue the case that schooling is both culpable for the youth "fall out" and yet also may be responsible for making an enormous difference, for the better. Schools must develop and change, however, if they're to turn the tide of student disaffection and become fit places in the future to develop, educate and support all youth.

### Fair field and no favours

In the words of Bill Renwick, past director general of the New Zealand Department of Education, we'll need "a fair field and no favours" for balanced and productive debate and to make informed decisions about the future.

Mr Renwick was a wise man. A fair field, he said, helps to clear the air, put longstanding differences aside and get on with the business. Unfortunately for him, his philosophy of equity and fair play for all and his politically unpopular views ruffled too

many feathers and brought him to grief at the hands of his political masters.

These days, no room exists for political manoeuvring. Shared leadership and mutual respect are needed. As Dwight D. Eisenhower, 34th US President, once said: "You do not lead by hitting people over the head - that's assault, not leadership."

### The wider evidence says that schools need to change now, for the future's sake.

As I see it, this leadership should coalesce around advocacy for youth - not middle schooling per se or some other form of schooling. For all concerned (for example teachers' associations - notably the PPTA, Ministry of Education officials, parents and principals' associations and researchers) this means suspending judgement on the specifics and resisting taking a stance on the question for debate before the evidence is in.

That said, however, the wider evidence, which parenthetically supports middle-schooling philosophy and practice in action, is compelling, and it has been mounting for over a century (see, for example, Tony Dowden's recent doctoral study on integrative curriculum, awarded the 2007 NZARE Sutton-Smith prize for the best educational research doctorate in New Zealand).

The wider evidence says that schools need to change now, for the future's sake.

Irish organisational theorist, Charles Handy, along with many others of similar standing (Michael Fullan, David Hargreaves, James Beane, Ken Robinson), says that schools as we know them are just plain obsolete. Designed for the nineteenth and twentieth centuries, they increasingly are unhealthy for all concerned:

- Organisational rigidity and rotational timetables deny healthy relationships and waste students' time;
- Subject structures and academic compartments prevent effective learning (and teaching);
- Hierarchic decision-making excludes parents and community from having a say; and
- Impersonal assessment regimes (such as NCEA) subvert the essential humanness of learning and schools.

Futurist of the past, Alvin Toffler (author of *Future Shock*, 1970) says replace the (obsolete) system, not the teachers. However, it's more than likely we'll need to reshape the way that they teach.

Daniel Pink (futurist of the present) says that existing school structures and organisation constrain teachers not to educate their students for the information-conceptual era, which students live in today, and impose tunnel vision on teaching.

Handy, Toffler and Pink (and many others) all say that if we want our communities and young people to develop

<sup>1</sup>See Neryda McNabb's principal profile article in this issue and also the New Zealand Department of Corrections, Briefing for Incoming Minister, November 2007 available at <http://www.corrections.govt.nz>



**Daniel Pink (futurist of the present) says that existing school structures and organisation constrain teachers not to educate their students for the information-conceptual era, which students live in today, and impose tunnel vision on teaching.**

and prosper, schools cannot stay as they are. Steve Maharey said in MSR Youth Issue 4 (November 2007) that we need a learning system not a teaching system - a system in schools that personalises learning. If that means abandoning the industrial model of schooling, then that's what we must do, he said.

Many teachers and principals around NZ, across all school sectors, are saying the same, and many are saying start with young adolescents. If we get the design right there, then the rest of schooling will follow.

Implementing that strategy may be our best shot at getting a clean bill of health for our twenty-first century schools, and our youth. It's hard to quantify the cost: probably not less than the Government's projected science and technology development bill (\$750 million). The argument for school system revamping is no less compelling.

Everyone who works with our youth knows that it's not them but us who must rise to the challenge: and help stem the tide of youth disaffection with and alienation from school. □

**Letters to the Editor:** Limited to 200-300 words.

**Invitation to Contribute:** Write an article, submit a report or write a description of an exemplary programme or work/teaching strategy for MSR (Middle School Review)

**Email:** [Editor@msr.org.nz](mailto:Editor@msr.org.nz)



# What pushed Peter Snell's buttons?

## Peter Snell talks to MSR Youth

With Garth Gilmour providing additional material and guidance

Fate, circumstances, chances, choices and many other factors may combine in different ways to influence an individual's course through life. These combinations may lead to wealth or to woe, to varying heights of success or to differing depths of failure, to happiness or to misery.

But one influence is common to all of us: our own personality, physical and psychological make-up, mental capacity, call it what you will. Whatever other influences are at work, the ultimate choice, the commitment to go this way or that way, to do this, that or the other is made by the individual. How well or how carelessly that choice is made is decided by the individual's mindset.

Peter Snell, our most remarkable middle-distance runner, is a classic example of a fiercely competitive mindset coupled with a will to be the best at whatever he set his mind to.

As a school pupil, subject to all the influences of his peers, his family and his teachers, he chose to concentrate more on sporting activities than scholastic achievement and, within a few years, he was a triple Olympic gold medalist and holder of a clutch of brilliant world records.

Then, as he entered his 30s, with his running career behind him and his life reasonably comfortably, but not totally, adapted to a public relations career and a

family, he executed an astonishing about-turn. He over-rode his lack of academic qualifications to become a university student in the United States and, again with remarkable speed, secured the degrees and experience that now have established him as a world authority on fitness and ageing.

**We live in an exciting era of discovery, technology and information but our lifestyles have contributed to a huge increase in degenerative diseases, particularly cardiovascular diseases, cancers, type 2 diabetes and possibly neurodegenerative diseases.**

Again, he demonstrated clearly his determination to become the best he can be at whatever task he sets himself. As an early

indication of that mindset, he was a natural left-hander and resisted all attempts at Opunake Primary School to make him write with his right but, at 16 years old, he made the change voluntarily because his left-hand writing from the top of the page was smudging his work at Mt Albert Grammar.

To find out what pushed Peter Snell's buttons, we asked him. His answers have been backed by input from Garth Gilmour, his collaborator in three books, *No Bugles No Drums* (1965), *Use It or Lose It* (2006) and *Peter Snell: From Olympian to Scientist* (2007).

*What sort of things did you do to keep fit and healthy when you were young?*

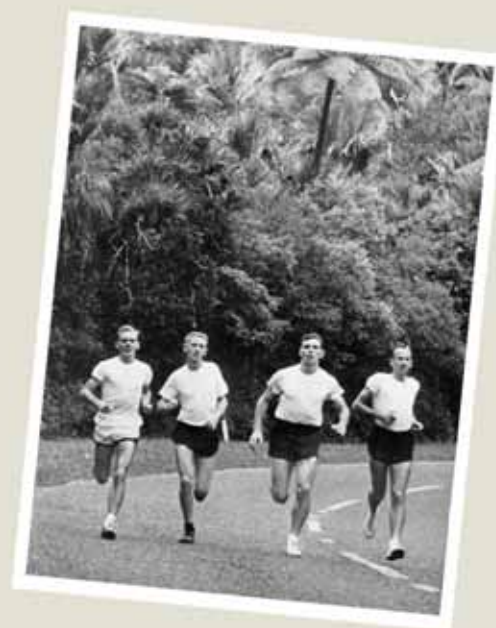
I was an active lad. I figured that the faster I got to an activity the longer I would have to do it, so I ran or cycled everywhere around Opunake.

My mother and father were sports-active, he at cricket, she at tennis. Opunake's beach, sheltered by a horseshoe of cliffs, provided an ideal background in which to develop the strength and co-ordination which led me to do well in a variety of sports.

Tennis was my first love, but I also became my father's shadow when the local cricket team played. At ten, I was led into rugby football but later I played badminton, golf – my father was a four-handicapper –



Everybody straining except Snell, who is bounding away round the final bend to win the 1962 New Zealand half-mile title.



and hockey. Everything interested me.

From the age of nine, I lived in Te Aroha, which provided lots of opportunities for sports and outdoor activities. We had an athletic and cycling club that had meets every Tuesday evening during the summer. I played rugby, hockey, badminton and gymnastics in the winter and athletics, cricket and tennis in the summer. I also explored the many bush tracks on Mount Te Aroha.

*Is it true that New Zealanders were physically fitter, lived healthier lives and ate better in your youth, than today? Why and how is this the case or not the case?*

There is absolutely no doubt that overall we were physically fitter then because we did not have widespread access to labour-saving technology, including cars, computers and machinery.

We may not have been healthier because nowadays we benefit from recent innovations in medicine, pharmaceuticals and health care. Our knowledge of what constitutes a healthy diet is much better today but this advantage is offset by the easy access to "fast" and convenience food, which is high in saturated fat and sugar.

We live in an exciting era of discovery, technology and information but our lifestyles have contributed to a huge increase in degenerative diseases,

particularly cardiovascular diseases, cancers, type 2 diabetes and possibly neurodegenerative diseases.

It is vital that we try to minimise our risk of developing diseases and infections by practising cleanliness, avoiding environmental toxins, such as tobacco smoke, taking care of our teeth, maintaining ideal body weight, eating plenty of fruits and vegetables, controlling blood pressure and cholesterol through diet and regular exercise, and getting seven hours sleep.

As we get older, it is even more important to exercise regularly to prevent muscle atrophy, osteoporosis, arthritis and other degenerative and inflammatory conditions. Unfortunately, exercise is often uncomfortable, especially as arthritis develops, and many people lapse into a sedentary state, which accelerates loss of function and exacerbates pain.

*How did your time at Mt Albert Grammar School contribute to your development educationally, personally, and in relation to sport and athletics?*

When it came time for secondary school, I went to board at Mt Albert Grammar as my parents thought this was the best thing to do. Mt Albert provided me with a broader range of science subjects that were not available at Te Aroha District High School, specifically physics, chemistry and calculus.

This background was useful when I later studied at the University of California. On the sports field, I benefited from the harder competition, especially in athletics. One runner who was beating me, Michael Macky, introduced me to Arthur Lydiard, an old boy of Mt Albert Grammar School, and he was a major influence in what happened from then on.

*You've given the impression, from time to time, that you weren't a sensational scholar in your school days, even though it's clear from your subsequent career that you weren't short of academic ability. When you look back, do you regret not getting more traction academically when you were at Mt Albert Grammar? Was it largely just a matter of schoolwork being far less appealing than sport?*

It is absolutely a regret because I was unable to pursue careers for which university entrance was a prerequisite.

From my own experience, both in academics and in sport, it is clear that erroneous judgments were made about my academic ability I formed self perceptions about my abilities based on performance. These did not take into account the potential for learning when the student is motivated and sees relevance in the material.

At Mt Albert Grammar, I could never have

>>



seen myself as earning a doctorate or being an Olympian, let alone winning a gold medal.

My experience underlines that habitual activity, preparation and opportunity underpin success rather than some innate talent or what we used to call “brains”.

I don't think that the boarding school environment suited me but, yes, schoolwork was boring and I enjoyed a variety of sports activities, which gave me the recognition that, apparently, was important to me.

Biology was my best subject but, unfortunately, the syllabus did not cover much human biology. My favourite teacher was Len Castle, who later stopped teaching and became an eminent potter.

*You've indicated that you especially were keen on tennis as a schoolboy. What was your style of game? How good were you? And who was the top competition for you?*

I was left-handed, not a particularly good server or net player, relying primarily on ground strokes. In Te Aroha, I was the best junior and competed in the New Zealand junior (under 17) championships, reaching the quarter-finals. I was eliminated in three sets by Lew Gerrard, who became a Davis Cup player.

At Mt Albert Grammar, I made the top teams in cricket and rugby and was tennis champion. At 17, I was third in the 880 yards, mile and cross-country behind two outstanding juniors, Tony Aston and Mike Macky.

I failed University Entrance, returned to try again and that year won those events. Four and a half years later, I earned my first Olympic gold medal. I like to say that had I not missed University Entrance the first time, I would have left Mt Albert Grammar without winning those events and, who knows, perhaps the Olympic medals.

*When you look back, do you have any serious regrets about those days? For instance, going to an all boys' school when girls were becoming more than just a passing interest?*

No regrets at the time about attending a boys-only school. I thought of girls as being a distraction. Now, I think that I missed an opportunity to interact with and be comfortable around girls which was not possible under the regimented conditions of

boarding school.

*On the positive side, what do you recall with special satisfaction (or even pride) about your time as a schoolboy and as a country town kid?*

Some of the best memories relate to the evolution of my abilities in a variety of sports. Of special satisfaction were the sports days where we competed for points towards our respective school “houses”. At Mt Albert Grammar, winning the Victor Ludorum trophy in my last year was a great source of pride.

*Is obesity really a problem in New Zealand and worldwide? If so, what do you think we can (and should) do about it?*

Obesity is characterised by excessive body fat. It is a major health problem in the United States and it's becoming one in New Zealand and many other parts of the world where Western eating habits are becoming entrenched. The simple solution is for people, (and especially children and young people) to exercise more and eat less and more sensibly.

Diabetes clearly is linked to obesity. The common form is type 2 or adult-onset diabetes, in which the body tissues (mainly muscle) become less sensitive to insulin. As this occurs, the pancreas secretes more insulin to keep blood glucose levels normal. Eventually, the pancreas is unable to keep up and blood sugar rises to produce a diabetic state. Doctors will then often prescribe insulin by injection or drugs to improve insulin action.

The best way to prevent or cure type 2 diabetes is, first, to avoid too much carbohydrate in the diet, especially foods and beverages containing sugar; and, second, to take daily exercise, either aerobic or resistance exercise, which is known to improve glucose uptake in muscle and reduce the need for insulin.

*A popular philosophy these days is that, among young people, everyone should be seen as a winner and no one as a loser. One nationwide running series for youngsters rewards everyone, whether first or last, with the same medal. No times are taken, no records kept. What is your view?*

The Peter Snell Institute of Sport in Auckland is doing the exact opposite. It

conducts expert talent searches in schools, using proven methods, and with the co-operation of Massey University, specifically looks for our future cyclists, rowers and swimmers. More than 20,000 have been tested in the last two years and a large number have been given our financial support.

At the Commonwealth Games in Melbourne, 19 New Zealand representatives had been given our support and six of them won medals. They included world shot put champion Valerie Vili, New Zealand's top middle-distance runner Nick Willis, two cyclists and two swimmers. We expect success on a similar scale in Beijing. The plan is to expand and enlarge our talent search programme to find even more of the winners in New Zealand.

*What do you do now to maintain fitness?*

I regularly take part in competitive orienteering; I ride a mountain bike about 4000k each year, cycling more than 12k to work and home most days of the year. At least once a week, I play an hour of racket ball (an American game similar to squash). I wear a step counter and try to achieve 10,000 steps a day.

*What is your opinion about the value of competition versus participation and just doing things for the fun of it?*

I enjoy hard fought competition, where the contestants are evenly matched and I don't have to win.

An impending competition will motivate me to train, just like a high school reunion will motivate some to lose weight. The move towards the philosophy that “everyone's a winner” and that competition is bad because it creates “winner” and “losers” is misguided.

*What do you think schools and workplaces should do to foster healthy and physically active people (not just young people – teachers, parents, grandparents – everyone)?*

Schools are judged by academic achievement and, in some instances, by the success of their sports people. Businesses are concerned about their productivity. The answer is for schools and communities to provide convenient and safe places for everyone to take part in physical activities. This means playing fields, gymnasiums,





walking and jogging trails and bike paths, with programmes that encourage participation.

*Can we do this better in NZ than other places, such as the USA?*

In schools, New Zealand is ahead of the USA because of the wider opportunity to take part in team sports. Unfortunately, the USA tends to concentrate resources on the top teams. The New Zealand club system, with volunteer administrators and coaches, has been very successful.

*Compared to the past, is it harder or easier to be an athlete (of any kind) and win gold medals today? Why or why not?*

The athletes today have higher standards to reach but, on the other hand, they have financial incentives that make full-time sports careers possible.

Live TV creates an audience that athletes of the past would have found difficult to imagine. Access to sports medicine specialists has improved the physical and psychological health of the athlete.

*Apart from the personal achievement aspect, why is winning a gold medal important for the individual?*

Winning a gold medal is important primarily as a standard recognised by others. It is like currency in the business of excellence.

The separation of winners from other competitors is a human invention with many weaknesses.

I agree with Rudyard Kipling who, in discussing triumph and disaster, referred to

both as "imposters" who should be treated the same. Here are two examples that explain what I mean.

First: I earned the 800 metres gold medal at Rome in 1960, because everything went well for me on the day but. But on the basis of that race, I did not see myself as superior to the runner-up, Roger Moens.

The outcome could easily have been different. For instance, what was the effect of the additional race on the first day of the heats? Had that not been necessary because of the large entry, Moens may have been the victor. But the extra race gave me the advantage because of my superior endurance.

Second: Consider the conquest of Everest. After British climbers failed on the final assault, the leader of the British team, Colonel Hunt, selected Edmund Hillary and Tenzing Norgay to try. Hunt overlooked George Lowe, who was, by all accounts, a superior technical climber to Hillary; but in Hunt's opinion he lacked the raw determination of Hillary to succeed. Hillary became instantly famous; George lives in comparative anonymity. □

*Garth Gilmour draws this conclusion: Hillary and Snell shared traits which enabled them to distinguish themselves in their chosen fields – superior fitness honed in the years leading to their greatest achievements and a refusal to see defeat as an option. They proved that, if you want something hard enough, you can get it.*

## Snell snippets

A world expert on aging, exercise and nutrition, Peter Snell says, "Exercise is the closest thing to an anti-aging pill that exists".

Peter Snell says, "The better I look after myself the more influence I have helping others, so I am interested in me, my own mortality".

## Snell strategies

For developing exercise habits (from Use It Or Lose It: Be Fit, Live Well, published by Penguin)

1. Develop a regular routine of exercise at the same time each day.
2. Find friends who exercise and join them.
3. Write "exercise" into your weekly schedule.
4. Hang shoes or equipment on a doorknob as a conscience pricker.
5. Set written goals specifying type of activity, frequency and duration.
6. Specify 'some' exercise, not necessarily one particular activity. Be flexible.
7. Control overwork and fatigue.
8. Expect and note any improved sense of well being and less tendency to depression.
9. Proclaim your intentions to family and friends. They make valuable monitors.

Feature

FINDING NEW  
DIRECTIONS



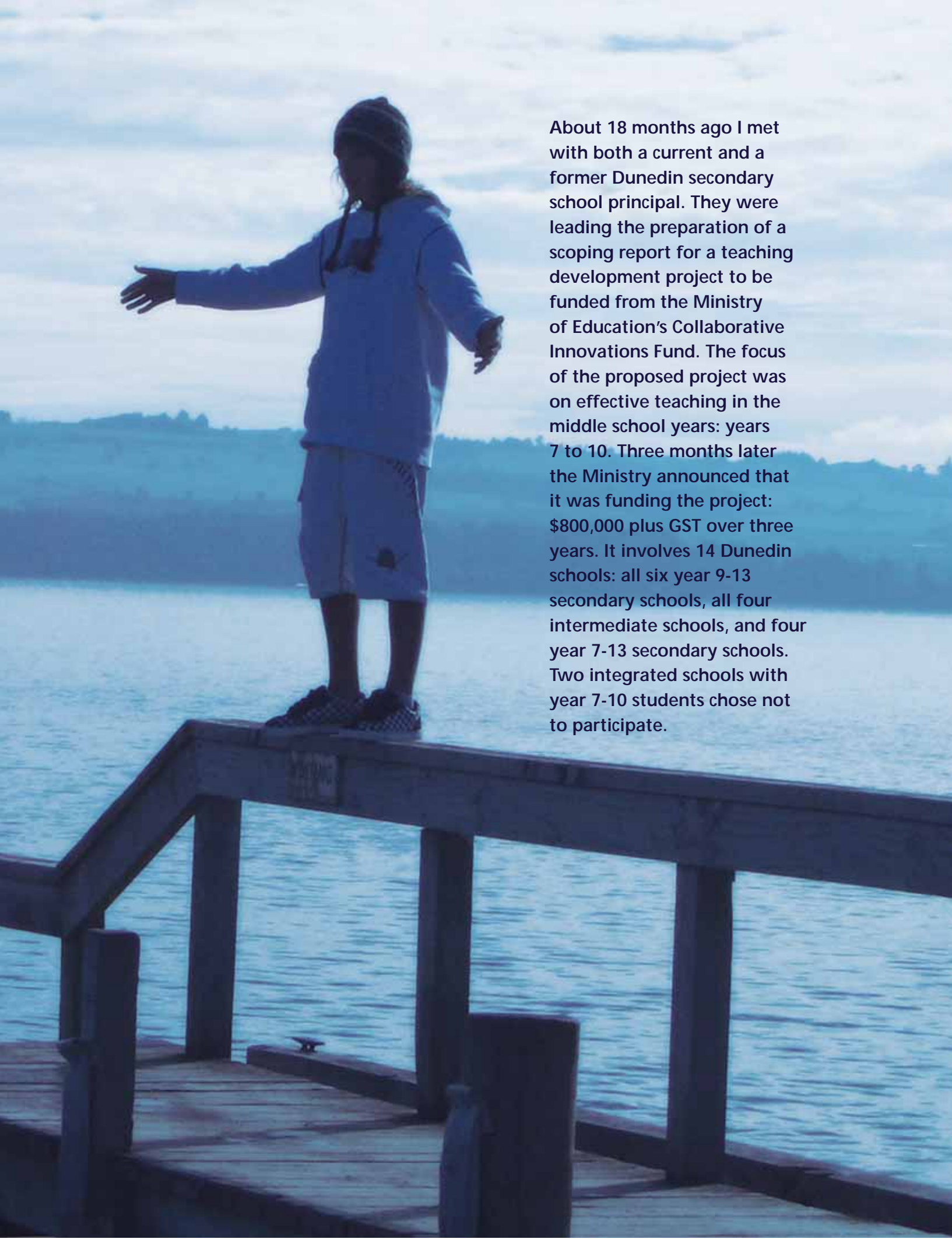
# Weak Education:

There is a better way

Terry Crooks  
Professor of Education  
University of Otago







About 18 months ago I met with both a current and a former Dunedin secondary school principal. They were leading the preparation of a scoping report for a teaching development project to be funded from the Ministry of Education's Collaborative Innovations Fund. The focus of the proposed project was on effective teaching in the middle school years: years 7 to 10. Three months later the Ministry announced that it was funding the project: \$800,000 plus GST over three years. It involves 14 Dunedin schools: all six year 9-13 secondary schools, all four intermediate schools, and four year 7-13 secondary schools. Two integrated schools with year 7-10 students chose not to participate.

The initial approach to me was to seek my ideas about appropriate outcome measures for the project. The planning group had been encouraged to use aTTle to provide some key outcome measures, but wanted also to explore other options. I saw no problems with the use of aTTle measures, but agreed that further measures needed to be considered.

My immediate comments were about what I believed was required to make a substantial difference in the educational programme of a school. The key ingredient, as I saw it, was a deep and shared belief among the staff of the school that change was desirable, and a corresponding commitment to the goals of the effort. As I put it, I felt the staff needed to share a conviction, deep down in their guts, that they wanted to work on bringing about specific improvements in the school's programme and its effects on students.

In light of this comment, I saw a particular challenge for a project that involved 14 schools. It was unlikely that the staff of all 14 schools would share the same concerns about their programmes, and therefore the same goals for change. If the overall project was to be successful, it needed to apply a common support framework but allow the individual schools a lot of freedom in the choice of the particular goals that they pursued.

Stimulated by the conversation we were having, and thinking about what outcomes I would be wanting to measure if I was in one of the project schools, I then outlined my main concerns about middle years education.

I talked about findings of the National Education Monitoring Project (NEMP), which I co-direct. In particular, I commented about the surveys of students' attitudes towards and involvement in activities related to different school subjects. Over each four year cycle of assessments, covering 15 different curriculum areas, NEMP reports include 11 of these surveys. With two notable exceptions (technology and physical education), the reports document a marked decline in enjoyment of the school programmes in the subject areas covered. While few students at either year level are really negative about each subject, more year 8 than year 4 students tend to express

moderately negative views, and many fewer year 8 than year 4 students choose the most positive rating. In other words, between year 4 and year 8 quite a lot of students change from a very positive to a moderately positive view of school subjects, and a significant percentage move from moderately positive to moderately negative.

I then mentioned the widespread view that year 10 (the old fourth form) is the low point in school enthusiasm and academic commitment for many students, and speculated on why this is. I suggested that it may have something to do with the limited subject choice that students have in the middle school years, and the extensive use of whole class teaching methods. Prior to the middle school years, greater use is made of instructional groups within classes, and after the middle school years students have substantial choice of the areas that they will study for examinations and qualifications.

### **It seems to me that a significant percentage of students effectively give up on school during their middle school years.**

It seems to me that a significant percentage of students effectively give up on school during their middle school years. They appear to lose faith that school has much to offer them, or that that they have sufficient talent to enjoy an adequate level of success to justify the effort that would be required. As a society, can we afford this level of loss of educational potential? If not, what can we do about it?

Perhaps we could see our school system as having three phases or stages. The early years, up to about year 5 or 6, would aim to develop basic skills. I am not just talking about literacy and numeracy, important though they clearly are in those years, but also laying the groundwork for skills (or competencies) and dispositions that will serve the students and their teachers well in the later years of education. For instance, it is never too soon to learn how to get on with other people, how to resolve disputes constructively, how to apply yourself to

a project until it is completed to a high standard, how to find relevant information and judge its value for a purpose, and to work on taking responsibility for your own work.

The later years of secondary education in New Zealand are largely focused on building up credentials for tertiary education and employment, as well as continuing to develop personal interests and hobbies that will give satisfaction throughout life. There are now a wide range of productive pathways that students can take through these years, if they reach this point with belief in the value of schooling for them and sufficient learning skills to take advantage of the opportunities on offer.

I am not alone in seeing the intervening years – the years of middle schooling – as the area of most concern in education. Other commentators in New Zealand and many other countries have expressed similar views. My main worry is the loss of faith in school and their own academic potential that many students suffer during these years. My wish is to find a way forward that considerably reduces this wastage, and therefore to set the stage for high levels of success in years 11 to 13 and beyond.

The most important issues involve students' engagement in their school learning and the degree of confidence that they build or maintain in their own capabilities as learners. Without these ingredients, students are likely to withdraw from serious effort in their educational programmes, and without effort little can be achieved. This sets the scene for a lot of frustration for students and teachers until the students can leave school.

As a result of this analysis, I have suggested to school representatives in the Dunedin Collaborative Middle Years Project that it might be very important to monitor educational outcomes such as these: students' enjoyment of schooling, student motivation to learn, students' confidence in the help that teachers and fellow students will offer them, and students' confidence in their growing capabilities to tackle new learning. Often, these are clustered together under the broad heading of student engagement.

Five colleagues from the University of Otago, University of Canterbury, and New Zealand Council for Educational Research have been working alongside me on



developing some options that schools might use to monitor outcomes like these. The schools could use these to compare the responses of students in years 7, 8, 9 and 10, with the goal of avoiding the apparent current pattern of declines across these years. More importantly, perhaps, they could use them to see if the responses of students in a particular year, such as year 10, improve across consecutive years as programme changes are put in place and fine-tuned.

All of the projects to date have involved questionnaires or rating scales that students would fill in. Two are quite wide ranging. One of these explores general attitudes to school, emotional safety in school, the support offered by teachers, perceptions of the value of schooling, and commitment to school learning activities and tasks. The other looks at students' perceptions of their current capabilities and their interest in improvement, in several areas: performance of a diverse list of school learning activities, motivation for learning, interest and skill in monitoring and controlling their own learning, relationships in school and beyond, and commitment to and involvement in a range of school and community activities.

Another questionnaire asks students to list their favourite school subject, rate how much they like that subject, and indicate the relative importance of factors that might have led to their interest in that subject. The focus here is not so much what subjects are chosen, interesting though that can be, but whether students have a subject that they love and whether their current school has played a major part in stimulating their interest. My theory is that one, really strongly enjoyed, subject helps a student to continue to value education and schooling, and acts as a springboard to subsequent success in other areas.

We have also available a questionnaire, adapted from a version used overseas, that explores the extent to which bullying is an important issue in the school. It identifies the extent to which students in school experience being bullied, acting as bullies, or helping to reduce or prevent bullying.

Another area under consideration relates more to assessing students' skills as learners, perhaps by developing one or more learning projects in areas unlikely to be widely explored in schools and studying how

well students handle the various aspects of the project: clarifying what they need to know and how they are going to begin, finding relevant information, interpreting and recording the information, deciding which of that information is most likely to be useful and trustworthy, and combining or synthesising the information to achieve the goals of the project.

**The focus here is not so much what subjects are chosen, interesting though that can be, but whether students have a subject that they love and whether their current school has played a major part in stimulating their interest.**

While the various assessment options discussed above seem to address some of the important issues in middle schooling, there are many more possibilities worthy of exploration. As I stated earlier, I think it is vital that each school identifies the most important issues that it wants to work on, and then tackles them with vigour and determination. Finding appropriate ways to monitor the progress being made is crucial: without these there is no firm evidence of the efficacy of the project, and a corresponding lack of explicit reward for the effort and inspiration involved.

It would be presumptuous of me, with no experience of teaching in the compulsory school years, to suggest recipes for how teachers and schools can change their approaches to address the concerns that I have identified about the outcomes of middle schooling. I do believe, however, that the research literature on learning suggests several strategies that might usefully be incorporated into revised approaches.

The first strategy is to place less emphasis on content coverage and preparation for the subject-specific knowledge and skills that will be needed in years 11 to 13. Instead of rapidly traversing a wide range

of content in a relatively shallow way, often leaving a substantial proportion of students floundering, teachers might concentrate on rather fewer topics and help their students pursue them in greater depth, concentrating on developing good learners and trying to ensure that all class members gain substantially from the learning experience.

The second strategy is closely related to the first. It involves placing less emphasis on subject specific assessment and reporting, and more emphasis on assessing and reporting the development of more general learning skills, competencies, disposition and attitudes. Because of the power of assessment to determine what is seen to matter, this would change the focus for teachers and students. It would require careful planning by school staff and liaison among them, especially if the students have several different teachers each day. An underlying argument is that subject learning in years 11 to 13 will proceed more efficiently and with better final outcomes if students come into those years with well developed learning skills and attitudes, more than compensating for a loss of prior subject-specific learning.

The third strategy is to offer a greater degree of choice than is common at present. Few of us enjoy being told what to do all of the time, and lack of choice limits the extent to which students can link new learning to areas of existing interest or expertise. Choice may be offered in various ways, such as a class choosing an agenda for the whole class from a range of options offered, students being allowed to choose from a range of electives offered, or learning tasks and assessments being designed flexibly enough so that individual students can adapt the tasks to take advantage of their interests and skills.

While I remained concerned that middle schooling in general is a weak area in our education system (and many others), I am happy to acknowledge that there are schools that are doing a great job in this area, and that many students have a very satisfying and stimulating experience of schooling in these years. I look forward to the day when very few students reach the end of year 10 uninspired by school and ill equipped for the learning that they will need in the rest of their lives, in and outside of the education system. □

# Energy for life

Stephen Stannard



## Special topic

### Introduction

Most people talk about energy in relation to how they feel physically or psychologically. Someone who is 'bouncing with energy' feels capable of doing plenty of physical or mental work. Scientists define 'energy' in physical terms as capacity to do work; work is the process of causing matter - something that occupies space - to move against an opposing force. For example, when we lift a dumbbell in the gym, we are doing work: we move matter (the dumbbell) against the force of gravity, and we use energy to do it. If we lift the dumbbell up and down many times, we do a lot of work, and that requires a lot of energy.

Beyond these simple everyday applications, it's important to have some understanding about energy and work for many other reasons. For example, it is important to know how to minimise our carbon footprint by consuming heat energy in a sustainable manner, and thereby also save money on the heating bill.

Most importantly though, for all of us, understanding the body's need for energy helps us to see and accept the importance of good nutrition and physical activity for our health and well being, now and in the long term, and to do something positive about it.



## Purpose

Hence the title of this article: 'Energy for life'. In the article, I discuss the nature and role of energy in our everyday lives, the way that nutrition and physical activity (exercise) help us create, store and use energy, and I explain how maintaining balance between food intake (nutrition) and physical activity can keep us more or less healthy, for a life time.

The process of learning and maintaining balance can start any time, but arguably it should start in childhood and be sustained throughout adolescence. I do not discuss at length schools' responsibility to include the topics of this article in the curriculum. It's noteworthy, however, that the recently released 2007 New Zealand Curriculum provides schools with a mandate to do so. This mandate is in relation to the key competencies of participating and contributing actively and managing self. It's important for schools to take up the mandate to help students combat the excessive misinformation out there about the relationship of nutrition and physical activity to health and disease and help them understand the role that both play in keeping us more or less energetic and healthy, life-long.

The need to make the argument and encourage schools to play an active and positive role is strong, particularly in light of Peter Snell's observations that:

*Our lifestyles (today) have contributed to a huge increase in degenerative diseases, particularly cardiovascular diseases, cancers, type 2 diabetes and possibly neurodegenerative diseases... (So,) it is vital that we try to minimise our risk of developing diseases and infections by practising cleanliness, avoiding environmental toxins, such as tobacco smoke, taking care of our teeth, maintaining an ideal body weight, eating plenty of fruits and vegetables, controlling blood pressure and cholesterol through diet and regular exercise, and getting seven hours sleep.*

The North American Nemours Foundation (<http://kidshealth.org>) agrees with Peter Snell – combining physical activity with a balanced diet is necessary to lead a full and energetic life. And the Foundation provides high-quality information and resources for schools, such as the food pyramid, physical

exercise and healthy eating programmes (see the website links located at the end of the article).

## Forms of energy

Energy exists in many forms - chemical, thermal, electrical, nuclear, and mechanical. In our daily lives, we harness each of these forms without a second thought, mostly to make things work in an orderly fashion, to heat the house, watch TV, drive the car or ride a bike.

As we go about our everyday lives, we constantly provide the cells in our body with the energy that they need to keep working properly and to stay healthy. This energy is chemical energy and it's in the food that we eat and digest daily, made up of carbohydrates, proteins, vitamins, minerals and fats. More about these in a moment.

It's important to know that each kind of food, whether carbohydrate or fat, plays an important role fuelling the body with the energy it needs and keeping us healthy – or NOT!

## The process of learning and maintaining balance can start any time, but arguably it should start in childhood and be sustained throughout adolescence.

## Energy storage in our bodies

The most basic fact of the matter is this: our bodies require energy continuously. The problem is that we cannot eat continuously throughout the day and night to supply a steady stream of energy – although some individuals eat the wrong foods all too frequently and too much of them, to their detriment.

Every day, long periods pass (such as while we're asleep at night) when we go without any food at all. During the day we can eat on demand if we want – in fact nutritionists and exercise physiologists recommend that we eat a little and often.

To deal with the variability of energy supply, humans have evolved the ability to store energy in their bodies. When food is not being eaten, we can switch to our bodies' energy stores, mainly in the form of carbohydrate and fat, for example as stored in the liver and muscles.

So how does this work? Firstly, our bodies need energy in the form of glycogen (which comes from carbohydrate foods) but we can only store small quantities of this source of energy in our bodies, whereas we can store an almost infinite amount of energy as fat!

In fact, our bodies prefer to store energy as fat for a very good reason. Not only does fat contain about 21/4 times more energy per gram than carbohydrate, but it is hydrophobic - not soluble in water.

In contrast, because glycogen is soluble in water, for each gram of it that's stored, nearly three grams of water is stored as well. This means that to store 37,000 kilojoules of energy in our bodies (about three days' energy supply) we can either store one kilogram of fat, or over eight kilograms of glycogen and associated water.

Because humans need to be active and mobile for daily tasks, it's much more efficient to carry stored energy as fat than as carbohydrate containing glycogen.

Here are three facts that explain why eating fat-containing foods is necessary (and good):

1. An average 70 kg man (15% body fat) stores about 400,000 kilojoules in just over 10 kg of body fat.
2. Storing that energy as carbohydrate would mean carrying an extra 92.5 kg of glycogen and water.
3. If you deplete your body of carbohydrates, by following the Atkins Diet for example, you lose a couple of kilograms very quickly, but of water, not fat.

So, to be healthy, we need a bit of (adipose) fat on our bodies, contrary to what many popular magazines say!

## What's adipose tissue and why is it so important?

Adipose tissue, commonly called fat tissue, consists of large spherical cells filled with fat. It's a type of connective tissue in humans (in fact vertebrates) that acts as an energy reserve, which is burned (metabolically

speaking) to meet the energy needs of the body. In the centre of our body it also pads and protects some organs, for example the kidneys and heart. Where located deep in the skin's lower (subcutaneous) layers, adipose tissue also insulates the body from heat and cold.

An excessive amount of adipose tissue is developed in the course of some disorders, especially obesity. In severely obese people, excess adipose tissue hanging downward from the abdomen, and referred to as a panniculus (or pannus), often can be removed only surgically.

**Dietary fat is not the enemy, but you'll want to choose the right amount - and the right kind - of fat. If you're getting most of your fat from lean meats, fish, and heart-healthy oils, you've already made (unsaturated and a modest amount of saturated) fat your friend.**

#### Fat's active role

Importantly, scientists have discovered that adipose tissue is not just passive energy storage or insulation tissue; it also has a more active role. Like other organs it has many blood vessels running through it and it's able to secrete hormones that affect other bodily processes. For instance, a critical level of body fat is needed for regular menstruation. If a woman falls under this level (due say to excessive dieting and/or extreme exercise), the resultant lack of monthly periods has further effects on the body, notably changes in the relative rates of bone formation and loss, which can lead to osteoporosis.

#### Energy balance

Energy balance occurs when 'energy intake' matches 'energy expenditure'. While energy intake is via the food we consume, energy expenditure takes many forms –from

reduced bodily functioning while asleep to high-energy physical activity such as tramping or biking.

*'Energy intake' is the total amount of energy in the food that we eat and it's measured as the sum of kilojoules in the fat, carbohydrate and protein that make up our day-to-day diet.*

*'Energy expenditure' is the total amount of energy we use. This is the sum of mechanical work that we do (physical work) and the body heat that our bodies release as a by-product of physical activity, for example through perspiration.*

Not surprisingly, children and adolescents have a large energy requirement because they have to store energy for growth, but at the same time they also expend a lot of energy in their day-to-day activities. And they often move in and out of energy balance simply by being active, doing things and burning up energy (and going into deficit) or by being inactive and having too much energy (a surplus), defined as follows:

- **Energy balance** is when *energy intake* equals *energy expenditure* and the result is no net storage of energy as body fat, glycogen or muscle.
- **Surplus**, called **caloric surplus**, means the body has a surplus of energy, as measured by the difference in the total number of calories consumed and those expended. When energy intake is greater than energy used, we store the extra energy as body fat, glycogen or muscle.
- **Deficit**, called **caloric deficit**, occurs when energy intake is smaller than the energy used or required to do physical activity (we feel short of energy), and as a consequence we use some of the energy already stored as body fat, glycogen or as muscle itself.

The way that we store extra energy when our bodies are in caloric surplus, and where we store it, is affected by several factors: how physically active we are; the type, intensity and duration of activity; whether or not one is growing or pregnant; medications; age; and gender. For example, if a pregnant woman is in caloric surplus she will store a bit more fat around her thighs and backside. In contrast, an adult man who is in a similar caloric surplus is more likely to store it on his belly.

Energy intake is measured by knowing

the energy content of the foods that we eat. This information, as well as the levels and kinds of (macro) nutrients in foods usually is printed on food packaging, for example carbohydrate as in pasta, rice and bread, and fats as in cheese, butter and milk and also many other foods, along with some vitamins and minerals.

As a general rule of thumb, foods with a high fat content also are high in energy. If a food is described as 'packed with energy', it's probably full of fat!

#### What's wrong, and right, with fatty food?

In theory, nothing's wrong. Indeed many types of fat are good for you, and some are essential. However, by eating a diet high in fatty foods, it is easier to be in caloric surplus. That's to say, extra energy is readily stored as fat in adipose tissue. The other thing about dietary fat is that some types, notably saturated fats (in fatty meats and cheese) and trans-fats (as in crispies and fish and chips), are not particularly good for your health. They clog up blood vessels and restrict the flow of blood and over time this can lead to circulation problems.

But, by eating healthy fresh foods and avoiding processed and 'fast' foods, it's pretty easy to avoid these problems (go to the Nemours Website for more information about fats at <http://kidshealth.org>).

#### Appetite and energy balance

Our bodies have their own built-in system for regulating energy balance. If we expend extra energy, for instance in exercise, we get hungry and eat more. If we are young and require energy for growth, we also eat more.

When we expend less energy than normal, our appetite is depressed. In some people this system doesn't work so well; consequently they can become too thin or too fat.

#### So what's the most important fuel for the body?

This is a commonly asked question. The most common answer is carbohydrate. From a dietary perspective, though, provided we are physically fit and healthy, our bodies burn fat very efficiently and fat makes an important contribution to our overall health



and well being.

*Dietary fat is not the enemy, but you'll want to choose the right amount - and the right kind - of fat. If you're getting most of your fat from lean meats, fish, and heart-healthy oils, you've already made (unsaturated and a modest amount of saturated) fat your friend.*

During exercise, however, carbohydrate becomes much more important as a fuel – and for active children and adolescents, carbohydrate-containing foods such as fruits, vegetables and grains are an important part of a healthy diet.

### Weight loss

More than half of adult men and women in New Zealand are overweight. These people are storing excessive amounts of energy on their bodies, as fat. This is dangerous, as high levels of body fat are implicated in the development of conditions such as cardiovascular (heart) disease, some cancers, and type 2 diabetes: the biggest killers in our modern society.

People become fat because they have spent long periods in caloric surplus. To lose this excess body fat, they must increase their energy expenditure or reduce their energy intake, or both, so that they are in caloric deficit for a good period of time.

The trick is to make sure that the stores of energy reduced are the fat stores, not the protein or carbohydrate located in muscles. That's because if we lose muscle, we lose not only strength, but also reduce our ability to burn off energy stored as fat. That fat is what we should be trying to get rid of and we need to maintain and use all our large skeletal muscles (for example biceps to lift the dumbbell) to make this happen, in conjunction with a balanced diet.

Burning off the excess fat is the priority because too much fat (adipose tissue) around the abdomen and the heart predisposes us to serious life-threatening diseases – for example heart disease and onset diabetes, which dramatically are on the increase in New Zealand.

### How fat should we be?

What should we do to make sure we're at a healthy body weight? Left to its own devices, our body quite easily maintains a healthy body weight. This is true especially

for adolescents because they are using up plenty of energy in the process of growing. So here are some pointers:

- Given a healthy diet, the risk of over-consumption of food is low.
- If adolescents eat a bit too much sometimes, provided they are given enough space to exercise they'll burn off the excess energy rather than store it as fat.
- Adolescents must have a healthy diet, and they must be given suitable physical space and time to expend their energy – at home and at school.
- A rumpus room with a computer and broadband access does not constitute suitable space.

### More than half of adult men and women in New Zealand are overweight.

**These people are storing excessive amounts of energy on their bodies, as fat. This is dangerous, as high levels of body fat are implicated in the development of conditions such as cardiovascular (heart) disease, some cancers, and type 2 diabetes: the biggest killers in our modern society.**

### Summary

"Energy" is a much used and abused word in society today. An understanding of the scientific definition and the biological concept of energy is essential to enable individuals to know better how their body works and to care for it.

Too often, the basic sciences of physics, chemistry and biology are learnt in isolation. Yet, when it comes to energy we can apply much 'hard' science knowledge to something that interests everyone: their own health.

An implication is that we seriously consider ways and means to include the study of energy for life in our school programmes. This study should be done at all school levels, but especially during early adolescence. This period is when young people want (and need) to know about getting, storing and using energy to cope with rapid physical growth and to do all the things that they want to do as they live full and healthy lives.

Such energy for life programmes may not be radical and hard to implement. That's because nowadays we have access to many resources to support learning and teaching on this topic and to engage students in personalised projects that are meaningful and personally useful.

The following four websites were designed specifically for teachers and students wanting to learn about food and nutrition, physical activity and fitness, their effects on health and wellbeing, and the hard (and fascinating) sciences of the human body that underpin them.

### WEBSITES

- Nemours Foundation at <http://kidshealth.org>.
- USA Department of Health and Human Services at <http://www.hhs.gov/>
- Human Body Systems – Student site at [http://www.stcms.si.edu/hbs/hbs\\_student.htm](http://www.stcms.si.edu/hbs/hbs_student.htm)
- Nutrition Australia at [http://www.nutritionaustralia.org/Nutrition\\_for\\_All\\_Ages/](http://www.nutritionaustralia.org/Nutrition_for_All_Ages/)
- Harvard School of Public Health at <http://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/pyramid/>

In summary, young people seem inherently interested in the topics of food, nutrition and physical exercise that affect their own health and wellbeing. They respond positively to learning the science behind them when they can readily see how it's real and relates to them personally.

I recently was told of a small experiment with the whole staff of a kura and an area school. They were asked to record their pulse rates using three methods. The activity not only got everyone involved, but they were still talking about it the next morning

>>

before school:

*Was my rate the same as yours? How low was the lowest, how high the highest? Whose were they? Did you get the same reading each time? Does the average actually mean anything?*

The questions intuitively and naturally involved human biology, some maths and statistics, and communication.

What did you eat for breakfast today,

was next on the agenda? Both activities asked simple questions and answering them raised even more. If that's the effect on the teachers (active learning-by-doing on a topic personal to them, and working together), then it's not too hard to imagine how the same or similar topics would engage the interest of students, sustain it and result in in-depth, durable learning.

It is not only important, increasingly, to

engage children and youth seriously in discussions, and action learning, on healthy eating and physical exercise, but it's also important to engage the schools, too. It's time to include these and related topics in the school curriculum and teach about them seriously, learn about them thoroughly and in interesting ways, and study them seriously. The actions we take about energy for life will affect us for the rest of our lives. □

## 2 in 1 step by step resource

### Food and Fitness resources

#### Five rules to achieve a healthy diet:

1. **Eat unprocessed foods:** You can't go past fresh fruits and vegetables as health foods. They contain plenty of vitamins, minerals, and antioxidants, are loaded with a variety of carbohydrates, and contain both soluble and insoluble fibre. Nuts and legumes also are good sources of these, but have the added bonus of containing significant quantities of protein. Porridge is a far superior breakfast to commercial cereals, and solid wholegrain bread is far superior to the white spongy varieties. Processed foods often are lacking in fibre, high in sodium, and devoid of antioxidants. Highly processed carbohydrate foods such as pastries, breads and breakfast cereals induce significant insulin production (bad) and are easy to overeat.
2. **Eat foods containing omega-3 fatty acids:** The best sources of omega-3 fatty acids are sea foods. However, you can also get your daily omega-3 supply from other foods such as linseed and walnuts. Eggs contain some omega-3 and even milk and cheese can be a source of omega-3 if the cattle are grass-fed.
3. **Avoid saturated fats:** These are the solid white fats found primarily in animal foods. The fat on the outside of your meat, the pork crackling and the white bits in salami are all saturated fats. However, some plant-derived fats

such as palm fat and coconut fat are saturated. Many fast foods are cooked in palm fat because it has a higher boiling point and therefore produces a crispier fried product.

4. **Eat when you're hungry:** Generally speaking, if you're not hungry, don't eat. You'll get hungry soon enough. But, if you know you are going to get hungry in the near future, make sure a healthy snack is available so that you're not tempted to buy junk food.
5. **Avoid soft drinks:** Although they have no fat, soft drinks are loaded with energy because they are so concentrated in sugar. Most soft drinks are acidic also and they are great for rotting your teeth. If you're thirsty, drink water. Have a soft drink occasionally, especially when you are being sociable, but don't make it a daily thing. Juices are a bit better than carbonated soft drinks, but should not be a substitute for fresh fruit. If you do want to drink juice, dilute it with water by 50% to reduce the energy content.

#### Five rules to achieve sufficient physical activity:

1. **Make it part of your daily life:** Incorporate physical activity into your daily routine. For most people the easiest way to do this is to include some physical activity on the way to work. Take some of your journey by bicycle or walk at least part of the way.
2. **Don't go too hard, but don't go too easy:** Stopping and smelling the flowers is nice, but it's not going to improve

your fitness very much. Physical activity should consist of some very easy times, but some harder times as well. If you play sport (other than chess or lawn bowls) you'll generally get sufficient intensity. If you don't, mix up your activities so that sometimes you are pushing yourself a bit (to the point of breathing hard), but sometimes you're taking it relatively easy.

3. **Find an activity you enjoy:** For some people this means competition (such as sport). But for others it might mean cycling or walking through the forest. Try a whole lot of different activities and persist with the ones that you enjoy. If you don't enjoy an activity, you're hardly likely to continue doing it for very long.
4. **Make sure there is a social aspect:** Enjoyment, for many people, means that a physical activity has to contain a social component. For sports this often is after the event or training. For more recreational activities it might mean having a chat during the activity itself. If you're exercising with someone, you need to be aware of their goals as well – sometimes this means you have to slow down for them.
5. **Do something that requires some strength:** If anything is an elixir of youth, it is resistance training. The old adage "use it or lose it" particularly applies to muscle. To make the most of your muscle, and to strengthen old and young bones, do some exercise which requires hard muscular effort. For many people doing a weight-training session in the gym is good, but for others it might mean chopping some wood or labouring in the garden. □



# Biotech

that doesn't bore you to tears

Through students' eyes:

Biotechnology that's real

Neryda McNabb

## Special topic

The smell of freshly baked bread fills the air of Neal Strydom's biotech room at Whakatane Intermediate School.

The South African-born teacher has multiple bread makers in his class and one of the first things he does with each new bunch of students is offer them a slice of warm bread and butter. In doing so he introduces them to one of the simplest everyday examples of biotechnology.

This is a subject the former secondary school biology teacher feels passionate about and his enthusiasm is catching.

You just have to look at the faces of his students as they assume the roles of forensic scientists in a murder investigation or work at creating their own range of Manuka honey-based skin products to know that this is an exciting class to be in.

It's something different, something meaningful and something they can relate to their everyday life. It's also something they know can lead to a multitude of career opportunities - and not just those that involve donning a white coat and working in a laboratory.

The New Zealand government has identified biotechnology as a key priority for the country's future and jobs in the industry range from sales and marketing to research and development to manufacturing and quality control.

Whakatane Intermediate is one of just a handful of New Zealand intermediate schools to offer this subject as part of its wider technology programme and the students know they are lucky.

Most of them have no idea what biotech is before they start - and neither do their parents.

For those unfamiliar with the term it refers to any technique that uses living organisms to tackle problems or respond to opportunities. From yoghurt making to fertilizer to plant propagation to cures for cancer - it's a part of everyday life and has been for thousands of years.

In Neal's class students experience first-hand the problem-focused nature of the industry and develop an appreciation of the complex solutions - including the technical, ethical, environmental and political considerations involved.

It might sound heavy stuff for 11 and 12 year olds to get their heads around but they enjoy the challenge and the relevance of what they are learning.

Last year's Year 7 students looked at the medicinal properties of herbs and after growing their own plants they used them to make skin lotions and balms.

"It was amazing how these kids really enjoyed seeing these plants grow," says Neal. "It was almost like a little miracle to them - it was great to see their enthusiasm."

He says the nice thing about this programme is that the kids get so excited about what they take home that they continue on with it. "I know of girls who are now selling their products at craft markets. Somehow they get so involved with it that they take it a step further and market it - and it ends up as gifts under the Christmas tree or for Mothers Day."

In Year 8 the students looked at the work of Professor Peter Molan, director of the Honey Research Unit at Waikato University, and the medicinal properties of honey or the Unique Manuka Factor (UMF) as it is known. After finding the best way to manage the honey they made soap, throat lozenges, lip balms and anti wrinkle cream.

They went on to design logos for the products, come up with a company name and even develop a business plan.

This is a subject all students would love a second crack at and each year a small number of them get the opportunity to take part in a five-day biotech intensive.

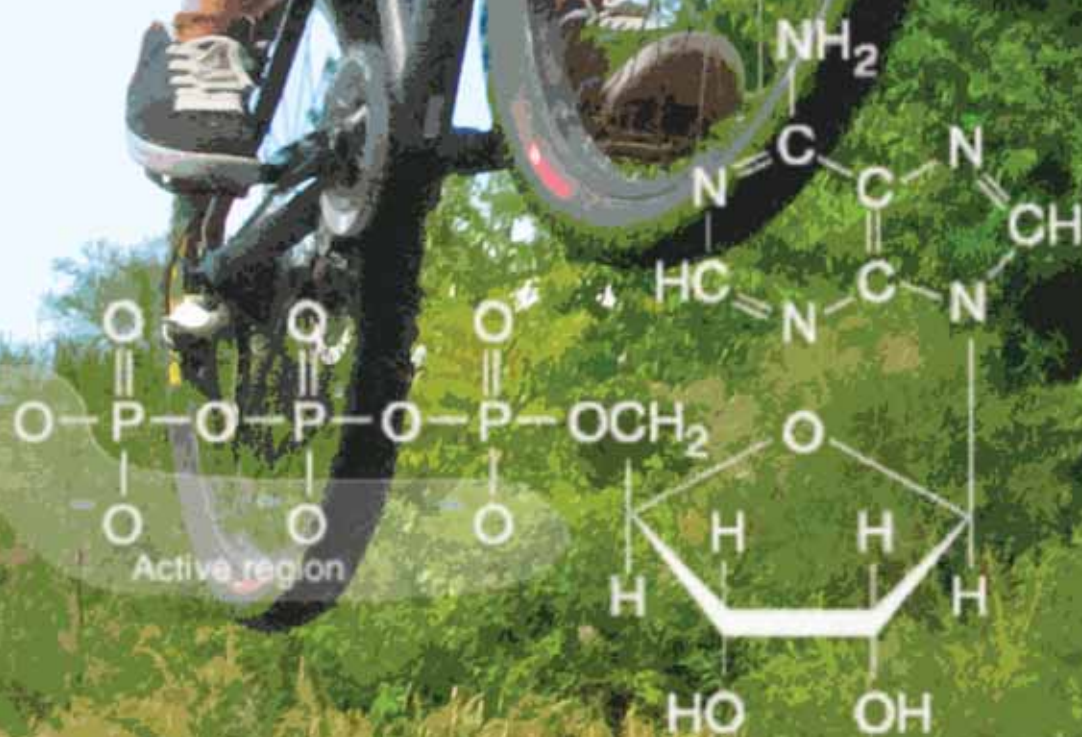
Last year, in Year 7, the focus was on the biological control of possum and together they looked at the impact of these pests on New Zealand's native bush, the cost to the country and how best to deal with the problem, taking into account such things as the humaneness of the various control methods.

The programme culminated with students creating a board game through which they could share their new found knowledge with classmates.

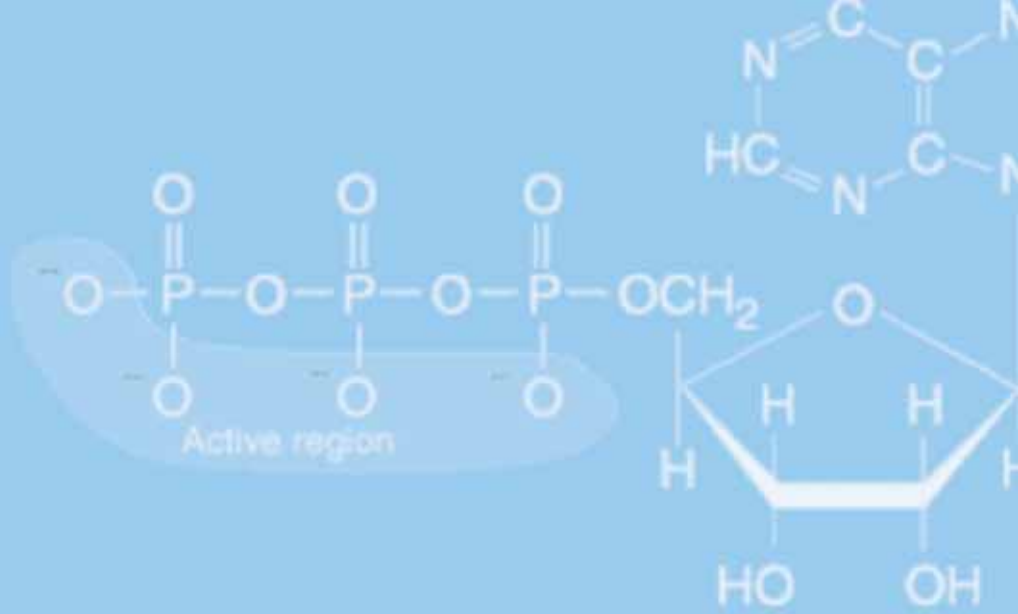
The Year 8 intensive saw students solving a baby kidnapping crime through analysing finger prints, blood samples and witness statements.

It would be easy to repeat the same units but Neal makes a point of coming up with something new every year. This year, students could find themselves creating bio fuels, hydroponics or studying traditional Maori medicine. With a subject this diverse the options and the opportunities are endless. □









# What hard science says

Regular exercise and healthy food

Stephen Stannard

Oxygen and food-borne nutrients (mainly glucose and fat) fuel our bodies, but it's not as simple as that. In the article *Energy for life*, I commented on why and how a sound knowledge of the basic sciences can be usefully applied to explain something that interests everyone: their own health.

Read on and find out more about some (though not all) of the biological processes involved - and understand better why regular (aerobic) physical exercise and a healthy food choice make a difference.

### ATP - the energy 'currency' of the body

The body's internal systems require oxygen to create energy in a form that is useful to our cells. This form of energy is called adenosine tri-phosphate or ATP. When we exercise (aerobically) our muscle cells in particular require more ATP so, in turn, they require more oxygen. Not surprisingly, we have to breathe harder to get that oxygen in!

But, food is required as well. Producing ATP requires not only oxygen but nutrients from food. Specifically, the fat, protein, and carbohydrate in food can all be broken down, and with oxygen combined to produce ATP. So, the more energy we expend, the more ATP our bodies must produce and the more food we must eat.

### Mitochondria

Production of ATP occurs mainly inside the mitochondria. These are tiny sub-cellular structures which reside in nearly all of the body's cells. Biologists call them the body's "cellular power plants".

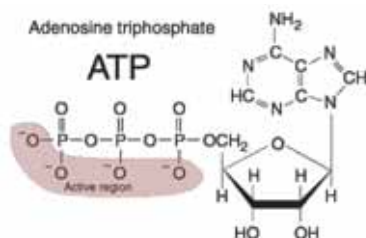
Mitochondria and ATP are as vital to the body's energy system as pistons and valves and a battery are to the engine of a motor car.

Here's how the process works. Please note that the explanation uses information drawn from the HyperPhysics project at <http://hyperphysics.phy-astr.gsu.edu>, along with the two supporting diagrams also from the same project and its website. The HyperPhysics project is a rich source of easy-to-understand and useful information on a

wide range of science topics.

### ATP in action

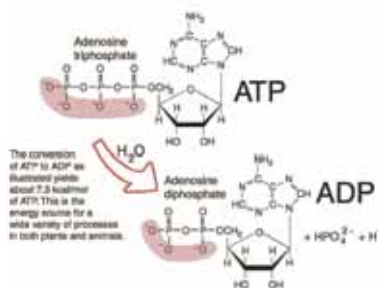
ATP is made up of all the basic elements for life: Carbon-C, Hydrogen-H, Nitrogen-N, Oxygen-O, and Phosphorus -P (see the ATP diagram below). Biologists say that ATP is the "energy currency of the body".



The right-hand side of the ATP molecule has an ordered carbon (C) compound as its backbone. But the triphosphate containing three phosphorus (P) atoms on the left side is the really important part.

The phosphorous atoms are connected to each other by the oxygen (O) atoms and they are linked also with the four oxygen atoms in the area coloured red. Under normal bodily conditions, each of the oxygen atoms in the red area (each with a negative charge) repels each other and wants to escape, so to speak. The ATP molecule contains a lot of potential energy for this reason.

When just one of the phosphate groups is removed from the end, leaving just two, the molecule is much happier. And that's how ATP converts itself into ADP – as shown in the ATP to ADP conversion diagram below.



In summary, all animals, humans included, use ATP like a battery. First the ATP creates power by losing one of its phosphorous groups to form ADP. Second we use food

energy along with the oxygen that our blood supplies to mitochondria and this helps to convert the ADP back to ATP. In this way, we "recharge" the body's mitochondria, putting them back into a high energy state, ready for action.

To get an idea of the energy stored in just one ATP molecule (an electron microscope is need to observe one), when an ATP molecule "rearranges" itself by cutting loose just one phosphate bond to produce ADP, it releases about the same energy as contained in a single peanut (for the technically minded it liberates 7.3 kilocalories per mole = 30.6 kJ/mol).

Considering that every energy cell in our bodies contains between 1000 and 2000 mitochondria, that's a lot of structures to produce and store the energy-for-life that we need and use daily.

### The role of (aerobic) exercise in health

And that's where aerobic (meaning "in the presence of oxygen") exercise comes in.

A major benefit of regular "aerobic exercise" (walking, running, biking) is that it improves the body's ability to make ATP through all the processes involved in oxygen and nutrient delivery to the cells. Most importantly these include your respiratory system (lungs), cardiovascular system (heart and blood vessels), and skeletal muscles. Without that regular aerobic exercise these systems can degrade and become unhealthy. In fact many of the chronic disease conditions that we see in society today, such as cardiovascular disease, can be related to a lack of exercise. □

*Steve Stannard, PhD is an exercise physiologist at Massey University currently working with Dr Peter Snell and other Massey researchers on topics related to healthy nutrition, physical activity and diabetes, and Maori health and development. Earlier he was a member of the Australian Commonwealth Games cycling team and remains active in long-distance road cycling and coaching young cyclists.*



A woman with dark hair tied back, wearing a red and white horizontally striped polo shirt and dark blue trousers, stands in a lush garden. She is holding a long-handled tool, possibly a trowel or a small shovel, in her right hand. The garden is filled with various green plants, including large-leafed foliage and climbing vines on a trellis. In the background, there are more trees and a clear sky. The overall scene is bright and sunny.

Special topic

# Seeds of knowledge

**How one school  
used a gardening  
competition  
to develop  
life skills and  
environmental  
awareness**

Anne Volmuller  
Deputy Principal



“Thank you for giving me vegetable plants to grow. It’s been really cool!”

These words, from one of the more colourful characters at Whakatane Intermediate School, brought a lump to the throat and a tear to the eye.

Neal Strydom (our biotechnology teacher) and I had been travelling round admiring the results of hours of hard work when we visited this young man’s vegetable garden. Beside a mass planting of taro was the thriving garden. Not a weed in sight! Latticed twigs and sticks held up beans, and marigolds were in full flower amongst the vegetables. Our young man stood proudly showing us the fruits of his endeavours, and explaining how his vegetable garden developed with the help of various family members.

This experience was just one from the 43 gardens we visited at lunchtime or after school over a week or so. We would load up the school van with nine children and set off to explore each one’s garden.

### Developing life skills

This idea grew from a seed! It developed from discussion on how important it is for the emerging adolescent (our students range from 10 years – 13 years) to learn a variety of life skills. Why not organise a vegetable garden competition, to encourage children to learn the skills involved in growing their own food?

The aim was for students to plant, nurture and reap the rewards of a vegetable garden. This would be done at home. Students would be responsible for the care and maintenance of their plot. They would also grow to understand how companion

plants work. For example, marigolds can keep the bugs away. They would also learn about budgeting – comparing the prices of home-grown and shop-bought vegetables.

**I told the children in each class that they only needed a small plot in the back yard – one metre by two metres. There was one condition: they were not allowed to dig up a patch in the middle of the back lawn!**

### Starting out

At the end of Term 3 last year we established numbers of those wanting to take part in this initiative. I had previously visited every class in the school, trying to motivate the students to take part. I was amazed at the response. We thought we might get a dozen or so interested, but in the end there were 60 confirmed participants – over 10% of the school!

When I visited the classes I shared a story about my brother, Peter Fraser, who is the current National President of the NZ Nurseryman’s Association, and owner of the wholesale firm “Growing Spectrum”. From the tender age of 10 years Peter developed a passion for growing things. Dad built him a glasshouse at the bottom of the garden and Peter grew seeds and propagated plants. This interest obviously grew and he is now one of New Zealand’s most successful nurserymen.

I pointed out some of the career choices available in the horticultural world and how starting small, as Peter did, can lead to anything. The children really related to this and became very enthusiastic. I suddenly realised that this idea might work.

I told the children in each class that they only needed a small plot in the back yard – one metre by two metres. There was one condition: they were not allowed to dig up a patch in the middle of the back lawn! As

an alternative, they could grow the plants in containers. All the seeds and plants would be supplied free to them at the beginning of Term 4.

### Preparing for planting

Over the holidays the children were to dig and prepare their plot for planting. Guidelines were given to help them think about what was necessary for a successful vegetable garden – site selection, soil preparation, water and drainage, sunshine etc. By the beginning of term 4 it would be “Let the planting begin”.

This is where things didn’t quite go according to plan. At the end of term 3, Neal got some of the prospective gardeners involved in planting seeds. They also made tiny seed pots from newspaper with the proper tools. They filled the little pots with potting mix and planted a seed in each pot: lettuce, marigold, capsicum, parsley, basil, tomato.

Neal tended to and watered hundreds of these pots over the holidays. However, the seeds proved very stubborn in their germination. The conditions were perfect and Neal was very perplexed as to why the seeds were not responding.

After two weeks we were back into Term 4 and hoping to give out lush seedlings to our young gardeners. Alas this was not to happen. The children kept pestering: “Are our plants ready to transplant?” Our woeful answer was, “We’re very sorry, but not quite yet!”

These seeds never grew past one centimetre. The potting mix was the culprit, but that is another story.

We talked to our Principal, Doug Mclean, about our dilemma. Thankfully he was able to fine-tune the budget. We approached Palmers Garden Centre and told them about our major problem: we had garden plots all prepared, ready and waiting, but zip to go in them! The garden centre was fantastic, and came to the party. They supported us by selling us seedlings at a wholesale rate – we were incredibly grateful for this. We now had parsley, basil, capsicum, lettuce, tomato, pea, and marigold seedlings ready to go.

The expressions of delight when the children collected their plants finally made our efforts worthwhile, as the seedlings

were large and healthy. The excitement was intense, with genuine enthusiasm to get home and plant.

From the weekend of planting (which, incidentally, was in harmony with the Maori calendar for planting), Neal and I had a continuous stream of dialogue with the children about the progress of their plants. We couldn't wait to get out and see their efforts at the end of the term.

What a humbling experience that turned out to be! As mentioned earlier, Neal and I took the school van full of gardeners and visited each home. We travelled from Te Teko to the other side of Opotiki, including gravel country roads, as well as many of the streets in Whakatane and Ohope. This was a real "outreach programme". The home and community were well and truly involved with this project. It totally reflected our school Mission Statement: "A friendly and caring school with quality learning and quality behaviour that respects the needs of the individual student in the spirit of partnership between the school, caregivers and the community".

### Community support

The comments from the parents were so positive and made the whole initiative even more worthwhile. At the very first garden we visited, the student had grown his plants in tubs outside the back door of the family's rented property. What a sight to behold! He had a huge smile on his face as we took a photo beside his well-tended plants – two containers on a concrete path, full of healthy flourishing vegetables. Neal and I looked at each other with huge grins on our faces. In the words of the young man at the beginning of this article: "It was so cool!"

As we continued on our travels, the children chatted excitedly about what we would see next. Some children had made scarecrows to "plant" in their garden, while others had plots that were nestled beside little playhouses. Some even had huge sunflowers, like guardians, towering over the vegetables.

Every garden we visited was unique and all the children were so proud of themselves. They all were able to chat about how their garden had evolved, including the highs and the lows they had encountered. We

had children asking: "Can we eat our vegetables yet?"

Some refused to pick anything until Neal and I had checked their garden. Some of the radishes were a little past their best; in fact they were almost turnips - but it didn't matter!

**Running this vegetable garden competition has shown multiple benefits for our school. To get the younger generation hooked into growing vegetables develops life-long skills, as well as building environmental awareness.**

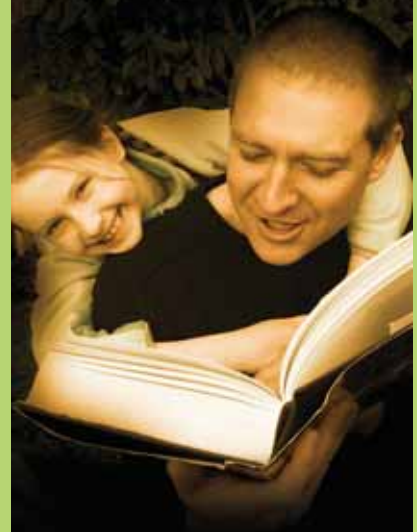
Running this vegetable garden competition has shown multiple benefits for our school. To get the younger generation hooked into growing vegetables develops life-long skills, as well as building environmental awareness.

Vegetable gardening also promotes the transfer of information from one generation to another. One of our children had her garden slotted into her grandparents' one, and had received lots of advice and encouragement from them. This child's mum commented on how thrilled she was to watch her daughter working alongside, and learning from them. Something like this can forge an incredible bond between the generations.

And so to 2008! We plan to do this exercise again, believe it or not. We have ideas that we hope will improve our organisation of this venture. We are going to launch the project with a presentation to our whole school at a formal assembly. Who knows how many more we can enthuse into vegetable gardening? If we can get the "It's been so cool!" response again, then all the hard work will have been worthwhile. □



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NZAIMS

# President's message

Bill Noble



So what's the future hold for middle schooling in New Zealand? That's a question many people ask me, often – from parents to business people who support my school or people who just want to know about middle schooling and middle schools.

The person asking usually does not distinguish between middle schooling – the process - a way of educating young people suited to them, and middle schools - the structure.

I tell them that intermediates have been around since the 1930s as New Zealand's school in the middle, and that Year 7 to 9 or 10 schools began to appear in the mid- 1990s.

They're often quite surprised to know that middle schooling – the process – can happen anywhere: in secondary schools, Year 9 to 13 or Year 7 to 13, or even full primaries which include Years 7 and 8.

I hasten to add that it's the intermediates and middle schools that most commonly use middle schooling methods – students do active and interactive learning, in a home room with a teacher who can blend many subjects together.

Sometimes the questioners persist: "Will the intermediates and middle schools survive?"

I answer the question with a question. "That depends", I say. "Are you for them or against them?"

Commonly, a prospective parent has heard someone else, maybe a secondary teacher, a PPTA representative or even a Ministry of Education official, comment, "The Government won't build any more intermediates" or "Just look at how they're closing down intermediates to support secondary schools which are failing and have falling rolls".

I tell them that this may or may not be the case.

The Post Primary Teachers Association (PPTA) doesn't help. That's because it takes every opportunity to criticise middle schooling. But that PPTA criticism has no basis in research. The PPTA has no facts to support its claims that specialist teaching should start earlier and that middle schooling's not good.

The PPTA President, Robin Duff, made such claims in the latest (February, 2008) PPTA Journal.

As I see it, his view is ill-informed and borders on the fanatical. He simply wants middle schools closed and middle schooling ideas erased.

That's a strange and indefensible position to take: The New Zealand Curriculum now identifies Years 7 to 10 as a learning pathway, and challenges everyone to acknowledge that young people, during these years, need schools and schooling that's designed especially for them. Simply placing Years 7 and 8 into a secondary school and making no other changes

won't do.

I invite the PPTA to join the discussion – to identify and find education solutions that work for early adolescents.

New Zealand middle schools, which include intermediates, will survive. That's because we:

- offer quality, personally responsive and challenging programmes;
- involve our students in deciding what works for them;
- know our students exceptionally well on a one-to-one basis; and
- provide affirming and positive relationships and supportive school structures that young people need across school Years 7 to 10.

Finally, it's interesting to note, over the past few months, the strong focus of the media and politicians on youth crime. NZAIMS has a proposal to Government to secure funding for additional pastoral support, so as to assist young people and take preventative action against youth disaffection and violence. We want to help prevent children becoming hardened young adolescents before it's too late.

It's as simple as this. Money spent before the fact is money well spent: prevention's better, and cheaper, than cure. That is what USA peace activist Coleman Power meant in MSR Youth Issue 4 when he said: "It is easier to build a peaceful child than repair a violent adult." □

Alwyn Poole

# For their futures sake

I hesitate to start with a quote from a social commentator but this one is enlightening:

"There is little doubt that the present generation of college young men and women is in serious moral difficulty. Many give little or no thought to the serious issues of life. Common decency and modesty in manners and dress apparently are things of the past. The fact that evil is called good while good is called evil seems to be of small concern to them."

Surely this echoes what many adults feel as they see and hear of young people behaving badly and wasting all of the chances that "we" are providing for them. It was written by Aristophanes 500 years before Christ. Do young people behave badly today? Yes. All of them do, some of the time, just like every previous generation but, I would argue that, many, many of the generation currently growing up in New Zealand are a cut above the previous generations and maybe that is a credit to the parenting they have had. This generation does face unique

challenges. They face total electronic media exposure and the demands of being viewed as consumers from an early age due to the level of disposable income they have. They are bombarded with the message of a lack of a future through environmental destruction. They are exposed to situations where they can behave like "adults" very early though sex, drugs and alcohol and told that all choices are valid. They have loads of free time which adults allow them to fill with electronic entertainment. In New Zealand they are given the most confusing qualifications structure devisable.

However many are beginning to see the opportunities in front of them and could become what I would call the da Vinci generation (with deference to Leonardo and not Dan Brown). This generation is breaking the mould of specialization and limitation in life brought about by the Industrial Revolution. The question: What will you do when you grow up? can be answered in terms of careers, but can also include - a musician, an artist, an

actor, a reader, a sports person, a great parent, an environmentalist, etc. This can be a multidimensional generation in a most fulfilling way. They can all be a part of the generation that ends poverty, restores environments, eradicates more diseases and provides hope for all future generations.

What do kids today need to become the best adults they can? They need adults who give them hope and vision (for them, their nation, their world) and are prepared to think through the big issues in life with them. They need adults who are positive about them, believe in them and love them unconditionally. They need boundaries and interest from those who care for them. They need every adult to be a role model in terms of their own love of life, activity and learning. □

*Alwyn Poole (BBS, DipTchg, MEd, PstGrdDipSportMgmt) is the founder and Principal of Mt Hobson Middle School and is just beginning a business providing educational and development advice to parents for their children. He is a father of three, teacher, sports coach, triathlete and perennial beginner on the guitar.*

# Non negotiable, we know what the better way is!

Doug Mclean, Principal Whakatane Intermediate School

Neryda McNabb

**Today, 2008, in Aotearoa New Zealand approximately, 9,000 young men 17 to 19 years of age either are in jail or on parole. That's equivalent to 15 medium sized boy's high schools, and it's a tragedy. It could be that many more are on the brink of doing something that will lead them to jail or, if not, to ongoing anti-social behaviour and contribute negatively to society, not positively, with mounting social and economic costs (Consulting clinical Psychologist).**

Doug Mclean, Principal at Whakatane Intermediate School says that it doesn't have to be this way. "If we ran our schools more like caring and supportive families" he says, "then maybe more adolescent students would feel valued, switched on, motivated to learn, and be achieving". And if we did this consistently, he argues, "From when they enter Year 7 right through to Year 10, then fewer would come to grief, fewer would drop out and fewer would end up in jail."

It's not rocket science he says: "Catch them when they're young and never give up on them, at school".

At Whakatane Intermediate he says "we live and learn together. It's holistic and connected, with lots of challenges and someone always is on hand to help. The boundaries are clear and good advice and help always are available when needed for whoever needs them, students, teachers and parents".

Parents, business people and many others in the community think that what Doug Mclean says, and does, makes good sense. So too does the Educational Review Office (ERO). It

recently rated his school pretty close to ten out of ten. ERO says in effect that Whakatane Intermediate is an exemplary school. It rated the school very highly for its perspective on young adolescents and for the actions that the whole school takes educating them holistically and supporting them.

When ERO first notified Doug McLean that his school was up for Review, he told them "don't bother to come if you've not informed yourselves about early adolescent needs and the middle schooling philosophy and approach". He says, "They didn't take too kindly to being told what to do, but they did their homework, nonetheless, and they came well informed and knowledgeable about what to look for and see".

## Middle schooling philosophy

At school, and in the community, when Doug McLean opens his mouth and extols the virtues of middle schooling philosophy and teaching methods, people sit up and listen.

He's passionate about his subject and it's palpable; you can feel the passion when he speaks. Simply, he knows what he's talking about and he knows it because he's "been there, done that".

This intermediate school principal is a rare breed - one of just a handful of principals, or possibly the only one that has been principal of, and taught in the full realm of the New Zealand school system; from preschool to contributing primary to full primary to intermediate and through to secondary and tertiary.

Yet, as a professional, it's the middle school years that hold the most interest for him. He's experienced and knowledgeable about this age group; he knows and understands their unique needs.

## Getting it right

For Doug it's all about getting it right and getting it right means a home room approach - preferably right through to Year 10. There is no question in his mind about this: Any school that has its Year 7 and 8's moving from class to class with no homeroom teacher, quite simply "has got it wrong".

If he was a betting man he might speculate on the educational background of the youths allegedly behind some of the tragic murders earlier this year. He might go so far as to say that "they went to a school that had a period to period structure, where it became far too easy for these students to fall through the cracks".

For 7 years in the 1980's, Doug Mclean taught in South Auckland. From then on his philosophy on middle school teaching methods never has faltered.

When as principal of an Area School in the 1990s and in a position to change the structure of Year 7 and 8, he said "I didn't think twice". He implemented the change and the whole school and students reaped the benefits: dramatically improved learning and behaviour outcomes. "At that stage the Year 7 and 8s dominated the school with their poor behaviour and poor attitudes to learning."

Looking back, his only regret is that he didn't push harder to do the same for the Year 9's and 10's. He wanted to but he says "the education system just wasn't ready", and he encountered resistance from subject-oriented teachers and parents whose (outdated) philosophy of education was based on how things were when they went to school. Doug's view: "Adolescents need a teacher dedicated to them, with the time to organise activities that address their needs and concerns and to liaise with the parents."





The Year 9 and 10 teachers in the area school, at the time, "didn't think about the impact on academic achievement of students losing one day of learning time a week by moving from room to room every 50 minutes. That's due to the secondary compartmentalised structure in which we teach many of our adolescents. It causes discontinuity in learning, it disrupts relationships between the teacher and student, and that's not what they need".

Doug wonders "Why do we persevere with an antiquated model imported from Great Britain? It's a system that inhibits teachers and it's not responsive to the needs of the adolescent." In contrast, he says, we need "a system that focuses on building and maintaining relationships, provides pastoral care and reduces truancy dramatically".

#### The bottom line

Doug McLean's bottom line for early adolescent education is this:

**"Adolescents need a teacher dedicated to them, with the time to organise activities that address their needs and concerns and to liaise with the parents."**

"We need to move away from one size fits all education. Young adolescents need responsive schools. These are schools that: understand the stress of changing and rapidly developing bodies, schools that value supportive and affirming relationships; and schools that understand the importance of friendships, academic pressures, sexual development and all the other changes that happen. Young adolescents don't need schools, and a school system, that casts them adrift".

In the schools they attend, whether intermediate or secondary, "the majority needs a home room and to be taught by teachers who are well qualified academically in a range of core subjects. They must be willing and keen to teach mathematics, literacy, and social sciences and be prepared to support their students by personalising their other learning, with constant encouragement, instructional teaching as needed and pastoral care."

Doug says that "young adolescents can cope with some specialisation". More importantly, he says, they need a huge range of educational experiences and opportunities to help them make well informed choices later in life; homeroom teachers are best placed to help them identify and take the opportunities, and encourage and support them. These are teachers he says "who develop clear lines of communication with the family; have high but attainable achievement expectations; and have a contagious passion for learning". □

# Getting physical

## Save your life NOW

The Editor reports on news from Harvard Medical School

In February 2008, a North American newspaper, The Oregonian, reported that obese teenagers turn to surgery as a last resort.

Reporter, Paige Parker (paigeparker@news.oregonian.com) commented that "in yet another sign of America's escalating childhood weight crisis, increasing numbers of morbidly obese teenagers have decided they will never control their eating without surgery".

So what are we doing to prevent the same situation developing here?

Peter Snell and Steve Stannard in this issue extol the benefits of regular physical exercise. It's a key factor (along with good eating habits) to living a healthy and enjoyable life and to preventing childhood and youth obesity: before obesity takes hold. And, the article by Debra Viadero explains the connection between physical exercise and enhanced learning. See [www.msr.org.nz](http://www.msr.org.nz).

All this comes as no surprise to those who know and understand the benefits and joy that regular physical activity brings: because THEY DO IT - daily walking, at pace to mountain biking.

A new (42 page) book from the Harvard Medical School, *Exercise: A Program You Can Live With* (2007) presents a comprehensive readable account of what to do and how and why. It covers everything from energy metabolism to selecting an exercise programme just for you.

This is no exercise fad-driven publication and it pulls no punches:

*If you want to improve your mood, help relieve insomnia, and lower your risk for heart disease, diabetes, high blood pressure, and colon cancer then, simply, DO REGULAR EXERCISE, and model the exercise habit and behaviour to your own children and the children you teach.*

The publishers say: "It may seem too good to be true, but it's not. Hundreds of studies conducted over the past 50 years demonstrate that exercise helps you feel better and live longer.

*Exercise: A Program You Can Live With* (2007) answers many important questions about physical activity, from how your body changes through exercise to the range of diseases it helps to prevent. It also explains how to start and maintain an exercise program that suits individual abilities and lifestyles. The book includes advice on being a savvy consumer of fitness products, as well as useful tools and tips to help make exercise work for you.

**If you want to improve your mood, help relieve insomnia, and lower your risk for heart disease, diabetes, high blood pressure, and colon cancer then, simply, DO REGULAR EXERCISE**

**Getting started:  
An excerpt from the book  
How Much Exercise Do I Need?**

So how active do you have to be to reap health benefits? This is where things can get tricky. It's true that for completely sedentary people, any activity has an effect. But it's also true that, up to certain limits, the more exercise you get, the better.

This principle was borne out in a 1986 study in the New England Journal of Medicine that analyzed research conducted on 17,000 Harvard alumni.

It appears that the greatest gains, in terms of longer life and lowered risk for disease, come when you expend approximately 2,000 calories per week

in some form of dynamic exercise, such as walking, gardening, or sports.

Sedentary men were 64% more likely to suffer a heart attack than their counterparts who exercised up to the 2,000-calorie level. This translated into an average two-year gain in life span for the most active group. Since walking or jogging burns roughly 100 calories per mile, the 2,000 calorie threshold can be reached by walking 20 miles per week or its equivalent, an hour of moderate exercise five or six days a week.

The challenge is to figure out exactly what these parameters mean for you. For people who are mostly sedentary, walking or jogging 20 miles is a tall order. In fact, it's neither a practical nor advisable target for people who haven't been off the couch in years. The good news is that the health benefits begin kicking in at a much lower level - around 700 calories per week. This translates to logging 7 miles a week, roughly a brisk half-hour walk four times a week. For many people, this is a much more reasonable goal. Once you've reached this goal, you should aim to hit the 1,000-calorie-a-week mark (about 10 miles a week), since several studies have linked specific health benefits, such as greater longevity, to this target. If you'd rather not count calories, this translates into 30 minutes of moderate activity, 5-6 times a week.

For more information go to:  
<http://www.health.harvard.edu/>

Other articles in this issue explain the importance of including physical activity, and active and interactive learning across the curriculum, in our school programmes.

Not to do so is to continue to place at risk the health and well being of our children and young people. A positive first step is for the schools themselves to encourage all staff members to be physically active, habitually, and provide opportunities, incentives and systems that make our schools physically active, health promoting places to develop and learn. □



# How much sleep do they need?

Dr Philippa Gander of the New Zealand Sleep-Wake Research Centre says that teenagers staying up late, oversleeping, and sleeping in class seems to be as common in New Zealand as it is in many other countries.

Dr Gander says that not getting enough sleep is a serious concern because lack of sleep has the potential to adversely affect teenagers' health, academic performance, and risk for injury and accidents.

NZ Pilot research (Gander and Borlase, 2002) highlights the magnitude of sleep deprivation that New Zealand teenagers experience:

- 75% of the Year 9 and Year 12 students studied, both male and female, got less sleep than they needed on school nights; and
- No differences were found between Year 9 and Year 12 students, in their likelihood of reporting insufficient sleep.

It could be argued that assisting teenagers to get the sleep they need is a family responsibility.

In 2000, Wellington High School thought differently. On the basis of its own survey research that year, the School took the unusual step of changing the Year 12 and Year 13 school start time from 9 am to 10:30 am.

The School did this because the survey revealed that 55% of its Year 9 students

and 75% of Year 12 students were getting less sleep than they needed on school nights. But the older students were sleeping considerably less and were more tired than younger students, and they were sleepier in class.

Philippa Gander says that the Principal and teachers are confident that the change is beneficial, although not reflected yet in academic outcomes. In 2008 the Sleep/Wake Research Centre is working with the School to evaluate systematically the effects of the change and it will compare responses in 2008 with those in 2000, which preceded the widespread use of cell phones and I-Pods. The Centre then plans to do much wider survey research in schools (for more information contact Dr Philippa Gander at P.H.Gander@massey.ac.nz).

In the meantime, the information below from the USA, Nemours Foundation suggests ways that schools and families can help teenagers (and children generally) to develop and maintain healthy sleep patterns, perhaps change family and school timetables.

See additional information below at the end of the article about the Nemours

Foundation and KidsHealth website: <http://kidshealth.org>

## The Nemours Foundations on Sleep?

Dr Philippa Gander of the New Zealand Sleep-Wake Research Centre endorses the following information summarised from the Nemours Foundation website at <http://www.kidshealth.org>.

## The importance of sleep

All adolescents need about 8½ to more than 9 hours of sleep each night.

The right amount of sleep is essential for anyone who wants to do well at school, play sports or be active in other ways -- without tripping over their feet.

## Why aren't they getting enough sleep?

In the past, adolescents got a bad rap for staying up late, oversleeping for school, and falling asleep in class. But recent studies show that adolescent sleep patterns actually differ from those of adults or children.

The studies show that during the teenage years, the body's circadian rhythm (the

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body's internal biological clock) resets itself temporarily, telling a person to fall asleep later and wake up later. This change in the circadian rhythm seems to be due to the fact that the brain hormone melatonin is produced later at night for adolescents than for children and adults. This can make it harder for them to fall asleep early.

The changes in rhythm coincide with a time when young people are busier than ever. For most adolescents, the pressure to do well in school is more intense than when they were primary pupils, and it's harder to get by without studying hard. And also they have other time demands - everything from sports and other extracurricular activities to fitting in a part-time job.

Early start times at some schools may also play a role causing sleep deficit. Adolescents who fall asleep after midnight still may have to get up early for school. This means that they may squeeze in only 6 or 7 hours of sleep a night!

A couple hours of missed sleep a night may not seem like a big deal, but can create a noticeable sleep deficit over time.



### Why Is sleep important?

Sleep deficit affects everything from paying attention in class to mood.

Research shows that more than 20% of high school students fall asleep in class, and experts have been able to tie lost sleep to poor academic performance. Lack of sleep also damages adolescents' ability to do their best in sports.

Slowed responses and poor concentration from lack of sleep don't just affect school or sports performance, though.

The fact that sleep deprivation slows reaction times can be life threatening for people who drive. The USA, National

Highway Safety Traffic Administration estimates that tired drivers, between the ages of 15 and 24, cause crashes that kill 1,500 people each year in the USA – more than half the people who cause crashes by falling asleep at the wheel are under the age of 26!

Lack of sleep also has been linked to emotional troubles, such as feelings of sadness and depression. Sleep helps keep us physically healthy, too, by slowing the body's systems enough to re-energize us after everyday activities.

**Research shows that more than 20% of high school students fall asleep in class, and experts have been able to tie lost sleep to poor academic performance.**

### How do I know if I'm getting enough sleep?

Even if you think you're getting enough sleep, you may not be. Here are some of the signs that you may need to get more sleep:

- difficulty waking up in the morning
- inability to concentrate
- falling asleep during classes
- feelings of moodiness and even depression

### How can adolescents get more sleep?

Recently, some researchers, parents, and teachers have suggested that adolescents begin school later in the morning to accommodate their need for more sleep. Some schools in the USA already have implemented later start times.

Students, parents, and teachers could lobby for later start times at school, but in the meantime young people will have to make their own adjustments.

Here are some things that may help adolescents (and adults) to sleep better:

- **Set a regular bedtime.** Going to bed at the same time each night signals to your body that it's time to sleep. Waking up at the same time every day can also help establish sleep patterns. So try to stick to your sleep schedule even on weekends.

Don't go to sleep more than an hour later or wake up more than 2 to 3 hours later than you do during the week.

- **Exercise regularly.** Try not to exercise right before bed, though, as it can rev you up and make it harder to fall asleep. Many sleep experts believe that exercising 5 or 6 hours before bedtime (in late afternoon) may actually help a person sleep.
- **Avoid stimulants.** Don't drink beverages with caffeine, such as soda and coffee, after 4 PM. Nicotine is also a stimulant, so quitting smoking may help you sleep better. And drinking alcohol in the evening can also cause a person to be restless and wake up during the night.
- **Relax your mind.** Avoid violent, scary, or action movies or television shows right before bed - anything that might set your mind and heart racing. Reading books with involved or active plots may also keep you from falling or staying asleep.
- **Unwind by keeping the lights low.** Light signals the brain that it's time to wake up. Staying away from bright lights (including computer screens!), as well as meditating or listening to soothing music, can help your body relax.
- **Don't nap too much.** Naps of more than 30 minutes during the day may keep you from falling asleep later.
- **Avoid all-nighters.** Don't wait until the night before a big test to study. Cutting back on sleep the night before a test may mean you perform worse than you would if you'd studied less but got more sleep.
- **Create the right sleeping environment.** Studies show that people sleep best in a dark room that is slightly on the cool side. Close your blinds or curtains (and make sure they're heavy enough to block out light) and turn down the thermostat in your room (pile on extra blankets or wear PJs if you're cold). Lots of noise can be a sleep turnoff, too.
- **Wake up with bright light.** Bright light in the morning signals to your body that it's time to get going.

### Message to all adolescents

If you're drowsy, it's hard to look and feel your best. So, schedule "sleep" as an item on your agenda to help you stay creative and healthy.

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#### End note:

*The Nemours Foundation* created the *KidsHealth* website as an authoritative source of health information for children and youth, which it updates constantly at: <http://www.kidshealth.org>. Medical experts at the following institutions created the website: The Nemours Foundation, the Alfred I. duPont Hospital for Children in Philadelphia, the Nemours Children's Clinics throughout Florida, and other children's health facilities nationwide in the USA.

The Nemours Foundation and KidsHealth support student investigations, projects and learning related to all aspects of students' health and well being. In particular it provides students with information, ideas and resources to:

- i. **Think with purposefully, creatively,** resourcefully designing health and wellbeing action learning and projects;
- ii. **Investigate and manage** their own health and well being;
- iii. **Interact and share with others** best practice health and well being strategies, notably those relating to food and nutrition and physical activity along the lines that Peter Snell and Steve Stannard recommend;
- iv. **Actively participate in and contribute to** (personal and peer) health and well being knowledge development and construction; and
- v. **Develop language, symbols and texts** to express their developing viewpoints and (in-depth) understanding of aspects of healthy living important to them, and communicate these to others.

See the *2007 New Zealand Curriculum* for more information about how students may apply and develop the key competencies tacit in the five points above. □

# Eel

poem (next page)

## Fiona Farrell

I make my living as a writer, which in New Zealand rarely means being able to sit in a booklined office, writing multimillion dollar novels. I do write novels and poetry but also find myself writing all sorts of other shorter things, which I like as they always take me to areas I had previously known little about.

This poem was written after I had been doing the research for a booklet for the walkers and cyclists on the Little River Rail Trail. The booklet was to be my donation to the trail, which runs along the route of an old railway line between Christchurch and Little River on Banks Peninsula. The route crosses two unique features unique in New Zealand and pretty unusual throughout the world altogether: the saline lagoons called Waihora/Wairewa or Lake Ellesmere and Lake Forsythe. They're amazing and beautiful places, stretching away to the horizon at the foot of the peninsula's volcanic hills. For centuries they were famed throughout the country as one of the most prolific sources of food in the country – especially their eels, long fin and short fin which were the basis of a thriving economy in the region.

That all ended with the arrival of European methods of farming. The lakes were drained to a small portion of their former size (it used to be possible to canoe all the way from Little River to the Heathcote estuary), and commercial fishing began to cut into the lakes' stocks of fish. The railway line was part of this process. Today, fish numbers are in decline. Long fin eels are thought to be extinct and short fins are dwindling.

One of the reasons is that eels don't breed in New Zealand waters. Any eel taken in New Zealand is immature. Their story is amazing.

I'd always disliked eels, those spooky things that wriggled in creeks. Like snakes for Australian children. I'd hated their slimy bodies, writhing round a stick when we tried to catch them.

I would never try to catch one now, not now that I know what amazing creatures they are. They are born in tropical waters, thousands of kilometres from New Zealand, and as tiny glassy creatures they drift on the currents till they arrive on our coast where they wriggle up the creeks looking like white bait. They live in a single river or bend in a creek for decades. The longest lived of all are the long fin females – those enormous eels that were taken as trophies by fishermen. When they are almost a hundred years old long fin females stop eating, their guts shrivel and are replaced by millions of eggs and the eel's body changes too. Her forehead flattens and a dark rim colours the area round her eyes. One night she turns and heads back down river to the sea. If she's lucky and not hooked out, she enters the ocean and swims north, finding her way in a manner not understood back to the place she'd left maybe a hundred years before. There, she releases her eggs. The males who live to around forty have already arrived in the same breeding ground and they also release their sperm. Then the adult eels die and the process starts all over again.

It's an amazing story, so I wrote a poem about it, because poetry is a traditional way of honouring important things. □

*Fiona Farrell, an outstanding teacher of young adolescents and pioneer of integrative learning, is now a noted New Zealand poet and author - [fionafarrell@xtra.co.nz](mailto:fionafarrell@xtra.co.nz).*

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# Eel

## Fiona Farrell

My youth was glass  
pip of my heart  
threaded  
on gut and vein  
for all to see.

Dark currents bore  
me west then south  
to boom and shatter,  
a wall of grey shingle.

I wriggled through,  
and dropped into  
my life.

Bird pipe  
flax rattle  
mud suck  
green leaf  
spinning on water.

Suspended in my  
small pond I lived  
my hundred years,  
forgetful of the sea  
beyond the bar,  
knowing only  
dimple of rain  
soft blur of star.

Growing thick as your  
leg on shreds torn from  
dead sheep, snapping  
at flies but never taking  
proffered bait.

I have lived as you have  
lived: cautiously.

But now I am old and the  
sea knocks at my head and  
there's a taste to the water  
that was not there before.

I cannot eat cannot settle  
guts shrunk to dry rattle.

I turn into the current  
and swim with the stream.

My eyes see more clearly now  
than they have ever seen.

They have become rimmed  
with blue, so that I may see  
in the dark that lies ahead.

My brow has flattened so that  
I may move without impedient  
though the dark that lies ahead.

My belly is heavy, frilled with  
eggs. 20 million strung on velvet.

I am become lean,  
and full of purpose.

I cross the bar on a moonless  
night, skin scraped blood raw  
on sharp shingle. Drop back  
into the dark, into the ocean  
where everything moves faster  
and the lights confuse.

I find my path, my body  
freighted with millions.

I am heavy with the future.

I bear it along the dark path,  
through forests of kelp and  
booming cavern. Following  
the taste in the water and the  
stars, marking left and right.

I swim north, then east. One  
undulating muscle, one blunt  
head barking at the moon.

I swim to the place where it is  
right to burst. Heave and writhe.  
Torn flesh.

Egg dances to sperm.

The water glitters like  
broken glass.

And now that's done.

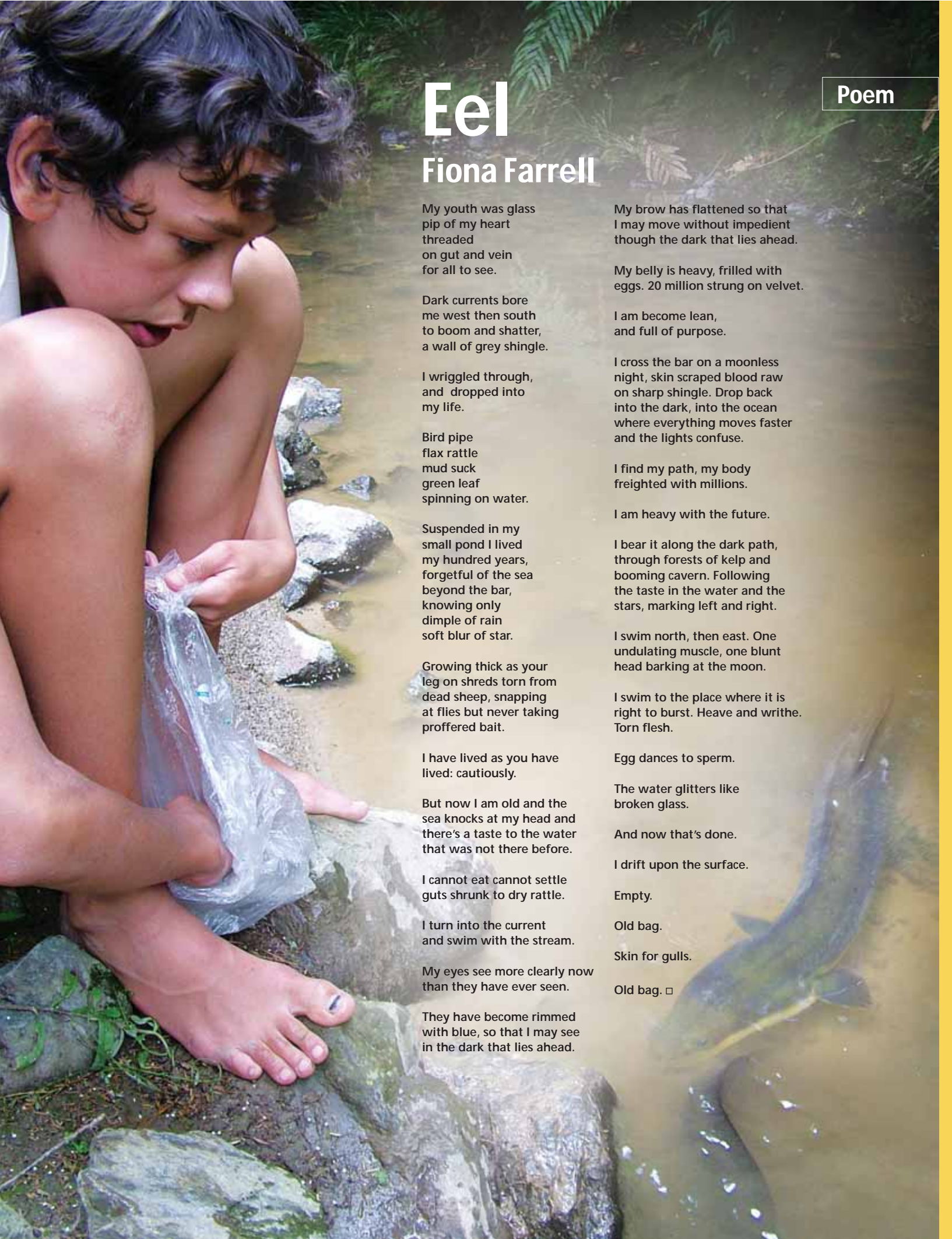
I drift upon the surface.

Empty.

Old bag.

Skin for gulls.

Old bag. □





# What the French are doing about **child obesity**

A French programme to prevent childhood obesity

## Teaching good eating habits to last a lifetime

Fergus Walsh - Medical correspondent, BBC News

Evreux in Normandy is at the forefront of a French programme to prevent childhood obesity.

This quiet town has been running the scheme for three years. It has now been adopted by 127 French towns, and has even spread to Spain. The UK Government is also said to be interested in the scheme.

France is deeply worried about its children getting fat. This image and food-conscious nation has seen a rise in both childhood and adult obesity. Data on childhood obesity is sketchy, so it is difficult to know just how serious the problem is - but there is a consensus that it is now a major concern.

### School focus

The programme is called EPODE (L'Ensemble Prévenons l'obésité des enfants) and its main focus is on primary school children.

Dieticians visit the schools to run special lessons on food.

I observed a special, once-a-year practical lesson when the children have breakfast together at school. The aim of the exercise is to encourage children to eat something in the morning and to ensure it is a balanced meal.

So I was surprised to see a large plate of Camembert being handed round the seven-year-olds by dietician Myriam Antolini. Full-fat cheese for breakfast - surely that's going too far?

"No, it's French!" Myriam laughed. "We try to show the children they can drink milk in the morning which is traditional or eat

a yogurt but they shouldn't forget cheese. It is rich in calcium and at breakfast it can replace another dairy product like milk."

**Of course, moderation is another key message.**

**Lunch in the canteen was three courses, but the portions were small.**

**The children started with vegetable soup and bread, followed by pasta in sauce with vegetables, and then fruit.**

### Celebrating food

In that response there is a glimpse of how the French view food.

They don't see it as simply nutrition but something to savour, to celebrate. That means variety and, when in Normandy, that involves local butter and cheese.

Breakfast sessions give children tips on a balanced diet

Of course, moderation is another key message. Lunch in the canteen was three courses, but the portions were small. The children started with vegetable soup and bread, followed by pasta in sauce with vegetables, and then fruit.

From an early age the children are taught about food groups. I watched a class of eight-year-olds trying to create balanced menus by using the different food groups, such as dairy, starch (bread, pasta rice,

potatoes, cereals), fruit, vegetables and meat.

### Different tastes

I also visited a nursery (kindergarten) to see some two-year-olds having lunch. Their starter was cold cooked asparagus, raw cauliflower and carrots - all with sauce dips. The idea is to introduce different tastes to the children early on, to get their palates used to more bitter and acid foods. The children loved it.

"We concentrate on prevention because we know that a child who is overweight at age 12 has an 80% chance of being obese all their life," said Sandrine Raffin, director of the EPODE programme.

"To gain a healthy lifestyle you need the whole of childhood to build good food habits and incorporate physical activity."

Nationally, big names in the food industry, like Nestlé, help fund the EPODE programme, but they do so at arm's length.

### Early impact

So is EPODE making a difference? Well, it is early days.

As part of the programme the children in Evreux have been weighed and measured every year since 2004. The results show there has been a small but tangible reduction in the proportion of overweight children. Set against a backdrop of dramatic increases in childhood and adult obesity, that is surely to be welcomed.

The scheme will need to run for several more years before one can be sure of its real impact. □

# Developing the future together



**Simon Lamb**  
Principal  
Takapuna Grammar School

“MUSAC, in conjunction with Knowledge Net and the OLE project have enabled Takapuna Grammar to connect student management systems with learning management systems. This union gives students, staff and parents unprecedented ability to track student achievement and to engage meaningfully about teaching and learning. MUSAC have been instrumental in enabling our school to strategically develop the primary function of student profiling, in its entirety.”



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