



TEACH YOUNG PEOPLE COMPUTER SCIENCE

Essential Skills for the 21st Century

LEARNING TO PROGRAMME A COMPUTER IS AN ESSENTIAL SKILL FOR THE 21ST CENTURY

WWW.DFRAG.CO.NZ

Why Computer Science?

Extract from *What is Computer Science and What do People Do Once They Know It?* [Code.org](http://code.org)

It is fast becoming recognised internationally that Computer Science and Programming are literacies as essential to learn as being able to read and write.

"Whether you want to uncover the secrets of the universe, or you just want to pursue a career in the 21st century, basic computer programming is an essential skill to learn."

Stephen Hawking

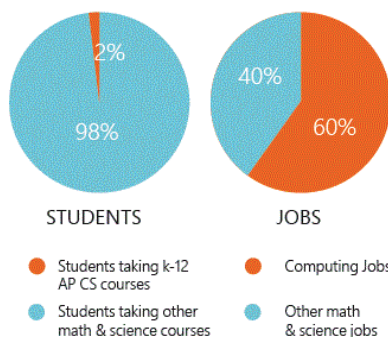
Foundational computer science courses in K-12 teach the fundamental concepts of computing, much like a physics course teaches fundamental concepts around the laws of motion and energy.

An understanding of the core principles of computer science is key even for jobs not directly focused on computing skills- - a June 2011 McKinsey Global Institute report predicts a shortfall of 1.5 million "data-savvy" manager and analysts by 2018.

Computer Science Teaches How to Think in Different Ways

Computer science develops students' computational and critical thinking skills and shows them how to create, not simply use, new technologies. This fundamental knowledge is needed to prepare students for the 21st century, regardless of their ultimate field of study or occupation.

Computer science education encompasses "the study of computers and algorithmic processes, including their principles, their hardware and software designs, their applications, and their impact on society."



From *Computing in the Core*. code.org

Why Teach Programming?

Kids spend an increasing portion of their lives interacting with and through screens about which they know little or nothing.

The more they do so, the more they accept the values of Facebook, Google, or iTunes as pre-existing conditions of the universe. Instead of opening their minds, technology shuts them down. Compounding all this, the few places most young people have available to learn about computers tend to teach them how to use and conform to existing software applications rather than how to make their own.

Introducing kids to code reveals to them how computers are really "anything" machines, capable of doing pretty much anything we program into them. It gives them the ability both to read and to write in the foundational languages of the digital age and, in doing so, fundamentally transforms their perspective from that of user to maker, consumer to creative.

-Douglas Rushkoff, author, *Program or be Programmed* rushkoff@codecademy.com

STEM Education in NZ

The *National Science Challenges Panel* has identified the need for government and its agencies to take concrete steps to promote the necessary science capacities and literacy of New Zealanders through four key areas, including:

Science, Technology, Engineering and Maths (STEM) education in primary and secondary schools

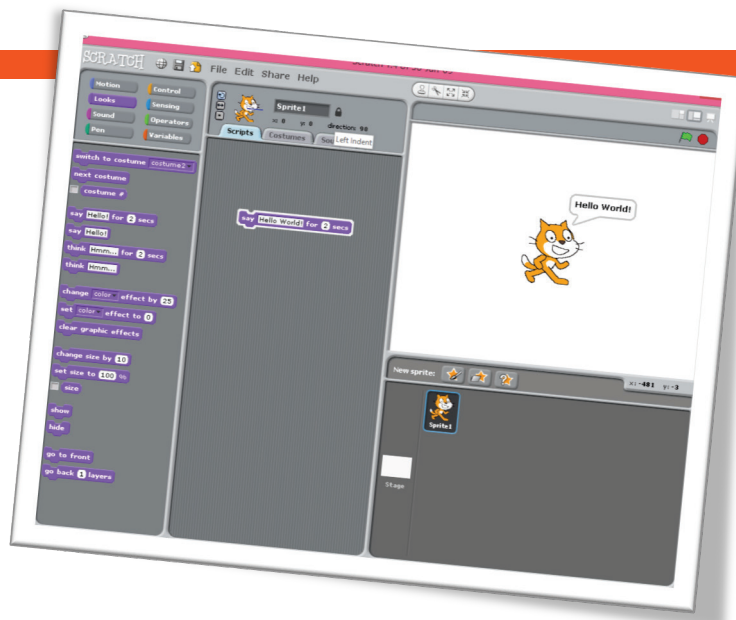
For more information see the Ministry of Business, Innovation & Employment's [Science & Society Project](#)

Starting from Scratch

by Ginette Van Praag

Scratch is a unique and internationally recognised programming language and environment, developed to be the perfect introduction to programming for young people.

The software is freely available to use in the browser or can be downloaded for use offline on a desktop computer.



Scratch is designed with learning and education in mind. A wide variety of educators have been supporting Scratch since 2007

Learn, Create, Share

Crucially Scratch is much easier to learn than traditional programming languages: to create a script, you simply snap together graphical blocks, much like **LEGO** bricks or puzzle pieces.

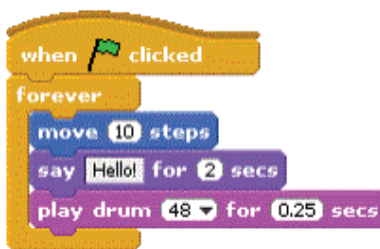
At the core of Scratch is a graphical programming language that lets the user easily combine graphics, photos, music and sound into **uniquely interactive creations**.

The Possibilities are Endless!

With Scratch, it's possible to create characters that dance, sing, and interact with one another. Or create images that whirl, spin, and animate in response to movements of the mouse. Or integrate images with sound effects to create an interactive report for school.

Cross-Curricular Application

The use of blocks within Scratch and its' friendly drag and drop method of compiling scripts is accessible for children as young as 6 or 7 years old. This places Scratch firmly in the primary space and can be used by students to create art, stories and projects **around any topic to support learning in any subject**- Maths, English, Science, Art, Social Studies, Humanities...



DFRAG PD Workshops

Our workshops are designed with this in mind and are intended to be flexible and easy to adapt to the needs of your staff and students. See the sidebar for a snapshot of our beginner workshop.

WORKSHOP SNAPSHOT

Beginner Teacher PD Workshop - Introduction to Scratch (Half Day) for Years 6-8

This workshop focuses on working with staff and covers the following topics:

- The Scratch 2.0 Online Interface / Desktop Application
- Setting Up An Online Account
- The Blocks
- Starter Activities – Tutorials
- Next Steps - Remix
- Next Steps – Make A Game
- Unit Plan Development Time

CONTACT US FOR FURTHER INFORMATION:
consultancy@dfrag.co.nz

Sign up for your regular **FREE** copy of **TEACH YOUNG PEOPLE COMPUTER SCIENCE** today.



The Teacher's Lounge is a free resource offering a 'one-stop-shop' for resources and materials supporting the new Digital Technologies standards since 2011.

About DFRAG Ltd

by Ginette Van Praag

Thank you for taking the time to read this first issue of **Teach Young People Computer Science**. I hope you have found it inspiring. **Please sign up to receive your regular copy, using the above link.** In future issues we intend to include writing and commentary from NZ's most authoritative advocates for the implementation of this very important subject into our schools. It is my hope that over the coming months this publication will evolve into an essential

resource that will inspire teachers to give programming a go in their classrooms.

As owner-operator of Digitech Friendly Resources & Gear (DFRAG) Ltd I am passionate about technology's huge potential for engaging and raising the achievement of our learners. My company is wholeheartedly committed to supporting this endeavour, and it is exciting to have the opportunity to raise awareness about this subject.