

# Hands up for the revolution

The new-generation graphical calculators are potent educational tools, **Nevil Hopley** writes

The new generation of graphical calculators do far more than just crunch numbers and draw graphs. They have the ability to be programmed in a similar way to the home computers of the 1980s. Indeed, their processor chips are the very same.

One of the current leading range of models is Texas Instruments' TI-83 series consisting of the 83, the 83 Plus and the 83 Plus Silver Edition.

There is now a vast amount of custom-written software available for these machines, from TI itself as well as from numerous programmers around the world.

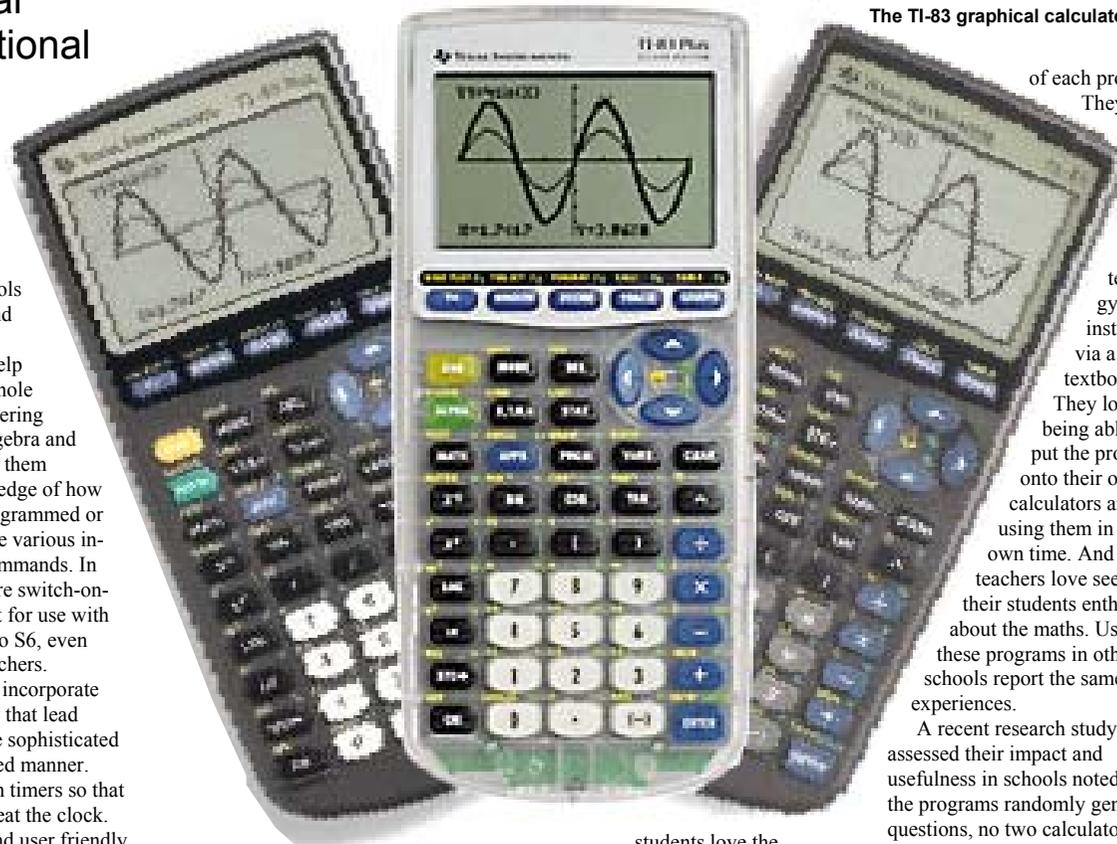
In the past the majority of the software was games but now there is a growing supply of calculator-based educational software for use in classrooms - and not just maths classes, either.

Over the past five years I have written many programs for the TI-83 range which are now regularly used in my own mathematics teaching at George Watson's

College in Edinburgh, in the 10 other maths classrooms in my department and in several other schools across Scotland and England.

The programs help students learn a whole range of skills covering shape, number, algebra and even logic. To use them requires no knowledge of how calculators are programmed or familiarity with the various in-built calculator commands. In many ways they are switch-on-and-go tools, great for use with students from P7 to S6, even better for busy teachers.

Many programs incorporate levels of difficulty that lead students to acquire sophisticated skills in a structured manner. Some have built-in timers so that they can try and beat the clock. All are intuitive and user friendly to operate. The collection of programs now guarantees teachers great lessons with their classes as



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students love the individual pace that adapts to how hard they find the work. They love the fun, competitive elements

of each program. They love learning via information technology instead of via a textbook.

They love being able to put the programs onto their own calculators and using them in their own time. And the teachers love seeing their students enthuse about the maths. Users of these programs in other schools report the same experiences.

A recent research study which assessed their impact and usefulness in schools noted that as the programs randomly generated questions, no two calculators presented the same problem. This led to the students discussing not what the answers were, but rather

what the right method was. How often have you tried to achieve that while working from a textbook?

When the students use one of the programs that are designed to develop non-calculator skills, these are often the most industrious lessons for everyone. Each student is desperate to know how to complete their own question so that they still have a chance to score 100 per cent by the end.

Ownership of graphical calculators has soared amongst students at George Watson's College, as has the number of class sets the department has needed to satisfy the teaching demand to take advantage of this hand-held learning revolution.

Free samples of graphical calculator programs are available from [www.CalculatorSoftware.co.uk](http://www.CalculatorSoftware.co.uk) Free training for TI graphical calculators is available from T3 Scotland [www.t3scotland.co.uk](http://www.t3scotland.co.uk) Free loan of calculators is available via [education.ti.com/uk](http://education.ti.com/uk)

#### SETT

Nevil Hopley, Head of Mathematics at George Watson's College, Edinburgh, will talk on More Than Just a Calculator on Thursday at 12:45pm.

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