sample pages

Title	Calculators in Classrooms: Using Them Sensibly
Author(s)	Paul Swan
Page(s)	5, 15, 50
ISBN/ISSN	978-0-9585632-4-6
Published by	A–Z Type

AAMT is the nation's premier organisation of mathematics educators: supporting and enhancing the work of teachers; promoting the learning of mathematics; representing and promoting interests in mathematics education.

POST GPO Box 1729 Adelaide SA 5001
PHONE 08 8363 0288
FAX 08 8362 9288
EMAIL office@aamt.edu.au
INTERNET www.aamt.edu.au

Contents

Calculator skills

The issue of whether students should be taught specific calculator skills is a complex one. Most people can pick up a calculator and perform a calculation without too much trouble so why do they need to be taught how to use a calculator? There are several reasons. The first is that the person using the calculator may be doing so inefficiently or worse still using a calculator when a better option would be to complete the calculation mentally. The second reason is that if students are taught to use a calculator properly they will make less errors when performing a calculation and better still they will have a good idea when a calculation does not 'look' right.

In this section some basic calculator skills will be reviewed. Note: the purpose of presenting a set of calculator skills in this way is not to suggest that students should be taught a set of calculator skills but rather that the teacher, with the students' help, can audit their understanding of how the calculator works. In the section that follows, various activities have been presented which will help highlight particular calculator skills while the students are investigating some worthwhile mathematics. Links between the skills and associated activities have been noted.

Ability to enter numbers into the calculator

Write some numbers in words on the board and have the students enter them into the calculator. You may be surprised at what is actually entered on the display.

Say a number and ask the students to enter it into their calculators. There is quite a difference between reading a number in words or in symbols and hearing that number. Watch for students who enter 2 034, when you say "two hundred and thirty-four". Some students think that every time you hear the word 'and', you write, or in this case, enter a zero. Closely associated with being able to enter numbers into a calculator, is being able to read and interpret numbers from the display.

Ask students to enter the following calculations into their calculators. Add \$4·32 and 47c. Many students will find their display shows 51·32. This occurs because the students have failed to convert to the same units. Either they need to convert the dollars to cents or the cents to dollars before performing the calculation.

The following snippets have been taken from Australian Association of Mathematics Teachers (1996). *Statement on the Use of Calculators and Computers for Mathematics in Australian Schools.* Adelaide: AAMT.

It is recommended that:

1. All students have ready access to appropriate technology as a means to support and extend their mathematics learning experiences.

This first statement might seem a little ambitious as all students includes students from Kindergarten on. Obviously the use of calculators with young children would be limited. As students' understanding of number grows so would their use of a calculator. Likewise the calculator is likely to become more sophisticated. If calculator use is delayed, then the introduction of calculators in the later years can produce a 'novelty effect' whereby students choose to use calculators for trivial calculations that would be better done 'in the head'. Anecdotal evidence would suggest that this novelty effect soon wears off.

2. Priority be given to the use of calculators and computers as a natural media for mathematics learning within a technology-rich learning environment.

It is envisaged that calculators would be used in much the same way as rulers and other mathematics tools are used - sensibly and when appropriate.

3. Teachers at all levels be actively involved in exploring ways to take full advantage of the potential of technology for mathematics learning within the total curriculum.

Hopefully books such as this will assist teachers to achieve this aim.

4. Students who use calculator and computer technology in the learning of mathematics have access to the same technological resources when their understanding of mathematics is being evaluated.

This statement is one of the more contentious found in the document. Consider the implications for assessing students.

This statement is well worth reading in its entirety. It may be accessed at http:www.aamt.edu.au.

Guestimate

This game not only builds estimation skills, but also helps to expose the common misconceptions that multiplying makes bigger and dividing makes smaller.

Students soon learn that multiplying a number by a number smaller than one actually produces a smaller result. Likewise, dividing one number by another number leas than one produces a larger result.

A game for two players sharing one calculator.

Player one enters any two-digit number onto the calculator.

Player two must *multiply* this by another number so that the answer will be as near to the target number, 100, as possible.

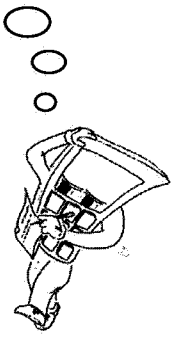
Player one then *multiplies* this new answer, trying to get nearer still to 100.

The players take it in turns until one player hits the target by getting 100 (digits after the decimal point do not count) on the calculator.

Record games in a table.

Here is a sample game:

Encourage the students to keep a record of the game using a format similar to the one shown. This will help you to spot any misconceptions the students might have.



Player	Keys pressed	Display shows	Thoughts
1	39	39	
2	x 2·5	97.5	A bit small.
1	x 1·1	107.25	Seven too much.
2	x 0·9	96.525	Too far the other way!
1	x 1.05	101.35125	Nearly.
2	x 0.99	100·33773	I win

Variations

Alter the guestimate target number.

Play a game of 'GUESTIMATE' where you are only allowed to press the [÷] button!

Player	Keys pressed	Display shows	Thoughts