



Teacher Notes for Number Grids

Compatibility: TI-83+/83+SE/84+/84+SE

Run The Program Called: **NG**

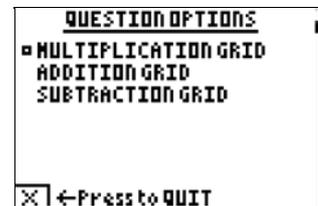
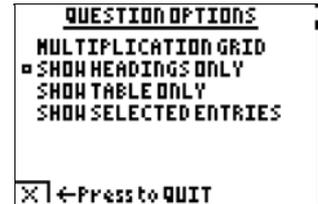
► Summary

This program tests students knowledge of the operations of multiplication, addition and subtraction on integers in a grid.

► Features

There is choice over whether to:

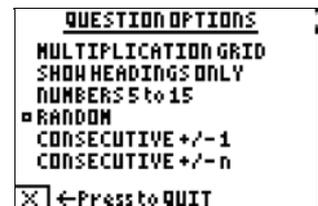
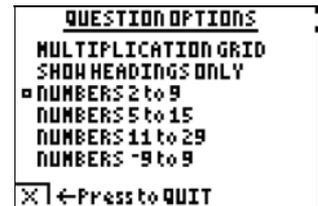
- **SHOW HEADINGS ONLY** to view only the row and column headers and thus complete the grid
- **SHOW TABLE ONLY** view the whole main grid and thus complete the row and column headers
- **SHOW SELECTED ENTRIES ONLY** view a selection of entries of the main grid and thus complete the row and column headers, and possibly the rest of the grid.



The user can also select the range of numbers which are used to generate each Number Grid plus whether these are:

- randomly ordered
- strictly consecutive (increasing or decreasing by one each time)
- in arithmetic progression (labelled “consecutive +/- n” on the menu)

(see displays to the right)

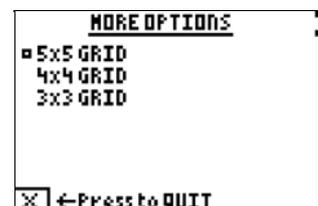


On nearly all screens and in all modes, there are **QUIT** buttons on display in the bottom left hand corner of the screen. To **QUIT**, press the **Y=** button.

Further Options

After the main options have been selected, the user can either **START** or select from further options including:

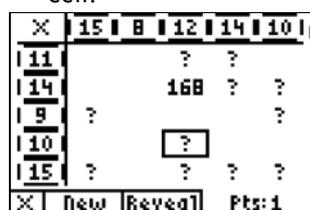
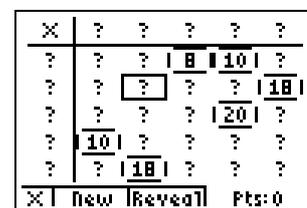
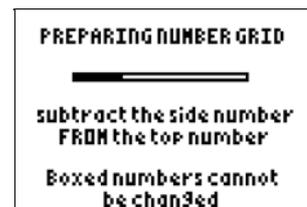
- the size of the grid (3x3, 4x4 or 5x5)
- whether the whole or only half of the grid is to be completed (only available when in **SHOW HEADINGS ONLY** mode)
- whether answers are displayed when entered. If they are chosen to be hidden, then a tick appears in the cell. This option prevents students



from “pattern spotting” with their answers after they have completed part of the grid.

Interaction with the Number Grid

- if the subtraction operation is selected then the side number is subtracted from the top number to generate the number in the grid.. This choice of order mirrors the process when subtraction calculations are set out in the “traditional” manner.
- where a number in the cell is “locked” and unable to be changed by the user, it has a box around it.
- where a number is awaiting to be entered, there is a “?” in the cell.
- movement from one cell to the next is via the **ARROW** keys, or the **ENTER** key.
- answers are entered by typing the digits when over the appropriate cell.



- the options to create a **NEW** grid, or **REVEAL** a cell’s number, are controlled by the 5 blue keys along the bottom of the display screen. Press the key aligned with the text that appears along the bottom of the screen.
- there is a scoring system of 1 point per attempted answer and 5 points per reveal
- there is a timer permanently on that displays the time taken when the grid is completed.

► Suggestions

It can often be beneficial for the teacher to spend the last 5/10 minutes of the previous lesson demonstrating via a viewpanel to the class, the program that they will subsequently be using themselves. This aids their familiarity with the task they will face and the menu options they will have to choose from, without the distraction of having a calculator in front of them at the time.

Depending on whether small positive, large positive or negative numbers are the focus of the work, it is advised for all students in a class to start off on the same options, with the opportunity for them to alter them in their subsequent games.

There is the clear objective to complete each game with the lowest time and lowest score. Allowing students the choice of re-attempting levels or increasing the difficulty of the grid involves them in setting their own challenges, good progress can be made at a pace that is appropriate for them as an individual.

The task of completing the grid from being given the headings clearly supports development of number bonds. By reversing the task and completing the headings from entries in the grid, the program can be useful preparation to factorising brackets, when choosing multiplication.

► Acknowledgements

This program was originally created for the publication “Lessons for the Maths Framework using ICT” written by Derek Ball and Barbara Ball and published by Pearson Education Ltd in 2003.