




## Grid Algebra: Simplifying

Topics	Difficulty range												
Simplification	<table border="1"><tr><td>From</td><td>★</td><td></td><td></td><td></td><td></td></tr><tr><td>To</td><td>★</td><td>★</td><td>★</td><td>★</td><td>★</td></tr></table>	From	★					To	★	★	★	★	★
From	★												
To	★	★	★	★	★								

### Preparation

Students are assumed to be familiar with the grid and journeys made on the grid. Load the grid: *Simplifying 1* (for a single row grid) or *Simplifying 2* (for a larger grid). It might be useful to have worked on *Expanding and factorising* before this. Description of grid: 5 columns, table 1 only (for *Simplifying 1*) or 1 to 6 (for *Simplifying 2*), do not allow negatives. The letter box is open, a letter is placed in a cell and another cell is highlighted.

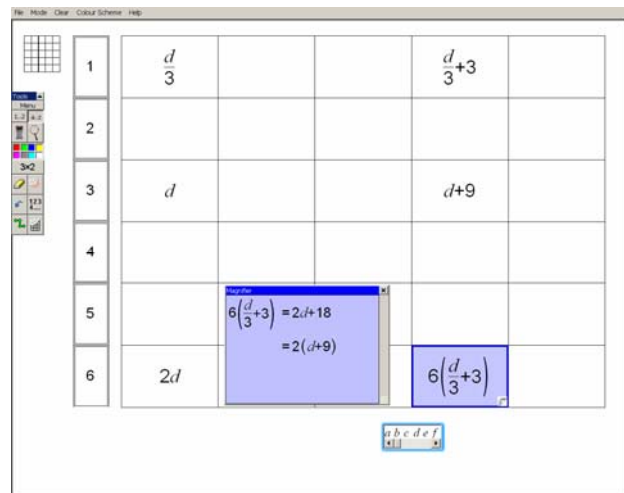
### Activity - (assuming an interactive whiteboard or projection - adapt for a computer room)

- Get a student to make a journey with the letter to the highlighted cell. Get other students to make other journeys. After you have several expressions in the highlighted cell click on the 'Magnifier' button  on the toolbar and put the magnifier into the highlighted cell to reveal all the expressions. Ask the students about which of these are simpler than others. What constitutes 'simpler'? Have they got a 'simplest' journey which is possible on the grid? How many such 'simplest' journeys are there?
- Click on Clear from the top menu and choose All Cells. Drop a letter into a cell. Highlight a different cell (for the larger grid make sure the highlighted cell is in a row which is a multiple or factor of the row which contains the letter). Make a journey from the letter to the highlighted cell which is not a simplest journey (do not make it too complex!). Then get a student to make a journey which is simpler. Drop in a magnifier and ask students how they could get from the original journey expression you made to the simpler expression they made.
- Clear all cells and repeat, but this time after your journey click on the 'Expression Calculator' button  from the toolbar and put it into the final cell and get students to enter in their simpler expression using the Expression Calculator.
- Repeat but this time after making your journey put a magnifier into the final cell and press the 'Hide grid' button  on the toolbar so that only the

magnifier is seen. The students now have to work out a simpler expression which will be accepted in the cell and enter it in the Expression Calculator (which you can drag into the magnified cell). Try to get the simplest.

- Repeat. Think about pre-preparing your own files with an expression in a magnified cell and the grid hidden so that students do not see the grid at all.

### Examples of screens



### Extensions/Simplifications

- You can choose how many rows to use and this will change the level of difficulty. With one row it will concern simplifying a series of additions and subtractions. With 6 rows it can involve interpreting relatively complex algebraic expressions and expanding and factorising.
- Also choose how complex to make your initial journey. You could do a complex journey and perhaps ask students to simplify it in stages (not going for a 'simplest' straight away). It can be a gradual process to arrive at a simplest expression.

### Related Resources

- Handouts:
  - *Simplifying 1*
  - *Simplifying 2*
- Grid Algebra Task:
  - *Simplify*