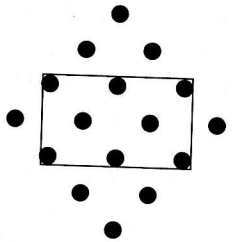
IDEA

42

'3 MULTIPLIED' BY 2 IS 8

This problem is an exploration of the traditional multiplication system on a square grid turned through 45° and works as follows.

On the 'turned' grid, draw a three-dot by two-dot rectangle.



Counting the number of dots in the whole rectangle we have a total of eight. In this system therefore, $3 * 2 = 8$.

(I deliberately decide not use the multiplication sign and seek to ensure that students don't confuse this 'different' system with the usual multiplication system.)

- What is $5 * 3$?
- What is $7 * 2$?

This can be developed to produce a two-way combination table under the * system.

Questions that arise can be:

- What are the 'square' numbers in this system?
- What is the general term for a 'square' number $n * n$?
- What is the general term for a 'rectangular' number $m * n$?
- What are the 'prime' numbers in this system?

The above system is one based upon dots on the perimeter dots being $\sqrt{2}$ apart. If the grid is turned through a different angle, so dots on the perimeter of a shape are $\sqrt{5}$ apart. Another different set of results are created and exploring this and other 'turned' systems will provide many opportunities for pattern spotting and algebraic generalization.

SECTION

3

Puzzles to cause your students to *shape up*