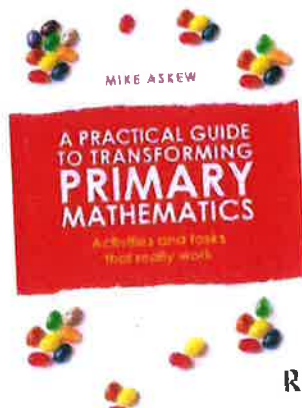




COUNTING ARRAYS

Foundational inquiry.

Stages

Key Stage 1.

Direct object of learning

Calculate totals in arrays and making connections between arrays and count in twos, fives, and tens.

Indirect object of learning

Reasoning: use and understand the language of rows and columns.

Tools

Images of arrays: these can easily be sourced from the Internet or created by cutting and repeatedly pasting images. The arrays should have either the number of rows or columns to be two, five or ten, for example a 2×6 , 3×5 , 4×2 array and so forth. You need a selection of these to display on the IWB and some simple ones printed off - two different sheets of arrays are needed for pupils to work with in pairs. Counters or cubes.

Task

Public talk

Project up on the IWB an image of an array of objects, for example a three by four array.

Ask the pupils to decide how many objects are in the array and to turn to their neighbour and see if they agree on the number. How can they be sure that they have counted correctly?

Invite pupils to say how many objects they think are in the array. Check if there is more than one answer - treat all suggestions equally, not indicating whether or not you agree or if they are correct but simply noting the suggestions on the board.

Invite pupils to say how they counted the number of objects. While many are likely to have counted the objects in ones, look out for anyone who, say, saw the number of objects in one row, or one column, and could use this to figure out the total without counting every object individually.

As the pupils describe how they found the total, introduce into the conversation the language of 'rows' and 'columns' to help the description.

After looking at and totalling up two or three such arrays, give out the sheets of arrays. The task for pairs is for one person to describe one of the arrays on their sheet (they should not show their partner the sheet). As they describe the array, their partner uses counters or cubes to recreate it. When the array has been completed they look at it alongside the image and check that it is correct. They then figure out how many objects are in the array and record the total on the sheet.

Assessment

- Can the pupils describe the arrays using the language of rows and columns?
- Do pupils use effective counting strategies for finding the total number of objects, for example, counting in twos or fives?

Private conversation

As the pupils are working on describing and constructing the arrays, talk to them about the patterns of twos, fives or tens in the arrays. Get them to run their fingers along the images or the counters to trace out the rows or the columns, using the language along the lines of, 'There are one, two, three rows with five spots in each row'. Or, 'There are one, two, three, four, five columns with three spots in each column'.

Public talk

Bring everyone together and display another array. Can the pupils describe this array in a variety of ways?

Variations

The arrays can be made up of separate items, or of items joined together. Over a series of such experiences in describing and counting objects organised in an array, start to introduce the arrays by only revealing a part at a time - as you show the number of items in one row and then in one column, can anyone figure out how many items there are altogether?

Source

Adapted from ideas developed in *Young Mathematicians at Work, Constructing Multiplication and Division* (Fosnot & Dolk, 2001a).