Counter place value

Children place counters on a PV grid to make three-digit numbers and then use logic to ensure they have made all combinations.

Skills practised:

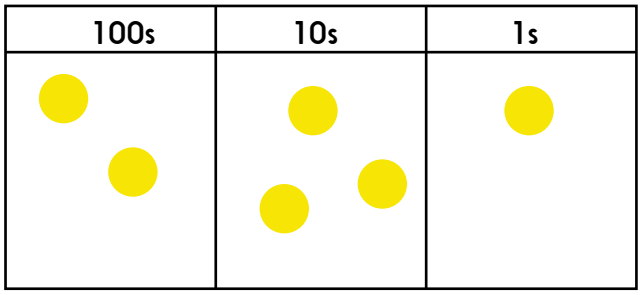
- Using knowledge of place value in three-digit numbers

***Conjecture**: It is possible to demonstrate that all possibilities in this context have been found.*

What to do:

Children work individually or in pairs.

1. Draw a large 100s, 10s and 1s place value grid.
2. Take six counters and place them in the grid to show a three-digit number. This arrangement makes the number 231.



2 3 1

3. Using all six counters...
   - What is the biggest number you can make?
   - What is the biggest number you can make where there is at least one counter in every space?
   - What is the smallest number you can make?
   - What is the smallest number you can make where there is at least one counter in every space?
4. How many three-digit numbers can you make? How can you be sure you have found them all?

HINT: Place all of the counters in the 100s column, then move one to the 10s column. What number have you made now? Where else can this counter go? Now keep four counters in the first column and think of where to put the two other counters to make different numbers. What might you do next? Make sure that you remember to keep a list of all the numbers you make!

Think of other challenges to set one another, e.g. what is the closest number to 300 that you can make?

Aims:

- To make all the possible three-digit numbers where the digits have a total of 6
- To use a system to help find all possibilities

Minimum number of calculations expected

22

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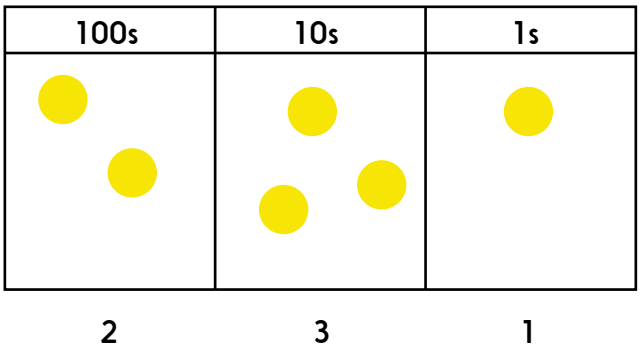
Counter place value

1. Draw a large place value grid like the one below with 100s, 10s and 1s columns.

2. Take six counters and place them in the grid to show a three-digit number.



3. Using all six counters...
   - What is the biggest number you can make?
   - What is the biggest number you can make where there is at least one counter in every space?
   - What is the smallest number you can make?
   - What is the smallest number you can make where there is at least one counter in every space?

4. How many three-digit numbers can you make? How can you be sure you have found them all?

Challenge

Think of another challenge. For example, what is the closest number to 300 that you can make?

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