What Numbers Can We Make?

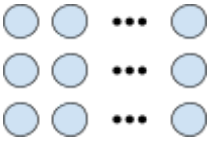
Imagine you had four bags containing a large number of 1s, 4s, 7s and 10s.

You can choose numbers from the bags and add them to make different totals. You don't have to use numbers from every bag, and there will always be as many of each number as you need.

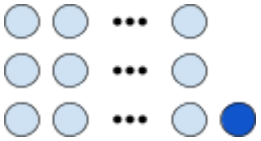
Choose some sets of 3 numbers and add them together.
What is special about your answers?
Can you explain what you've noticed?

Charlie and Alison represented what was happening.

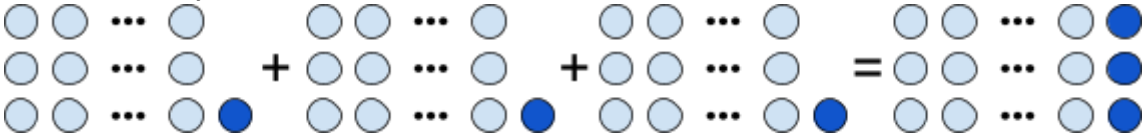
Charlie's representation:
Multiples of 3 can be represented as:



The numbers in the bags can be represented as:



When I choose three numbers, I end up with a multiple of three +3 which will be a multiple of three.



Alison's representation:
Since all multiples of three can be written in the form $3n$, the numbers in the bags can be written in the form $3n+1$.

As long as I remember I'm working with multiples of three, I could call these numbers +0, +1 and +2 numbers for short.
When I choose three numbers, I'm adding together three +1s, so I end up with a multiple of three +3 which will be a multiple of three.

What if you choose sets of 4 numbers and add them together?
What if you choose sets of 5 numbers, 6 numbers, 7 numbers...?
What totals do you think it would be possible to make if you choose 99 numbers? Or 100 numbers?