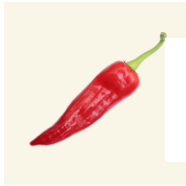# Year 4 Maths Friday 29.1.21
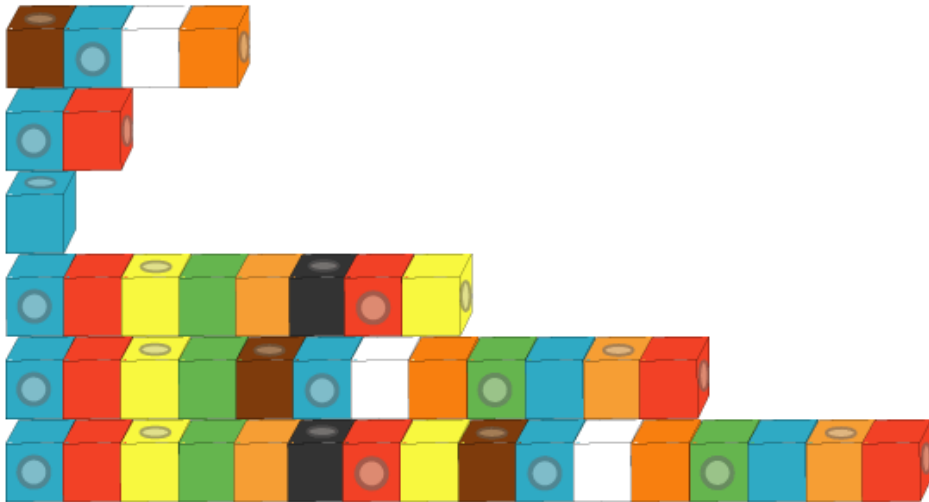
Nrich Fraction challenges!

Nrich problem

Making Longer, Making Shorter

First, Ahmed used interlocking cubes to make a rod four cubes long:
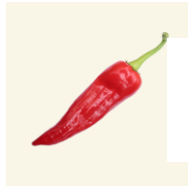
How many cubes did he need to make a rod twice the length of that one?
How many cubes did he need to make one three times the length?
How many cubes did he need to make one four times the length?
How many cubes did he need to make a rod half the length of his first one?
How many cubes did he need to make a rod a quarter of the length of his first one?

These rods are the ones Ahmed made:

Which one is twice the length of Ahmed's first rod?
Which one is three times the length?
Which one is four times the length?
Which one is half the length of his first rod?
Which one is a quarter of the length of his first rod?
Which one is the same length as his first rod?

Nrich problem 🌶️ **Making Longer, Making Shorter**

Answers!

I used my 4 times table to find the answer when we were making longer rods. e.g.
$4 \times 2 = 8$, $4 \times 3 = 12$ and $4 \times 4 = 16$.

I used my knowledge of the 2 and 4 times tables to find the shorter rods. Half of 4 is 2 and a quarter of 4 is 1.

Ahmed's rod is four cubes long

How many cubes did he need to make a rod twice the length of that one? $4 \times 2 = 8$
How many cubes did he need to make one three times the length? $4 \times 3 = 12$
How many cubes did he need to make one four times the length? $4 \times 4 = 16$
How many cubes did he need to make a rod half the length of his first one?
$4 \div 2 = 2$
How many cubes did he need to make a rod a quarter of the length of his first one?
$4 \div 4 = 1$

the first picture of blocks is equal to Ahmed's
the second is half of Ahmed's blocks
the third is a quarter
the fourth is twice Ahmed's blocks
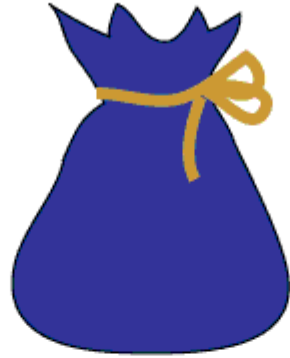the fifth is three times Ahmed's blocks
the last one is four times Ahmed's blocks

Nrich problem

Andy's Marbles

Andy and his friend Sam were walking along the road together. Andy had a big bag of marbles.

Unfortunately the bottom of the bag split and all the marbles spilled out. Poor Andy!

Go to the next page!

Andy's Marbles

One third ($\frac{1}{3}$) of the marbles rolled down the slope too quickly for Andy to pick them up. One sixth ($\frac{1}{6}$) of all the marbles disappeared into the rain-water drain.

Andy and Sam picked up all they could but half ($\frac{1}{2}$) of the marbles that remained nearby were picked up by other children who ran off with them.

Andy counted all the marbles he and Sam had rescued.
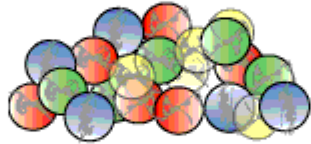
He gave one third ($\frac{1}{3}$) of these to Sam for helping him pick them up. Andy put his remaining marbles into his pocket. There were 14 of them.

How many marbles were there in Andy's bag before the bottom split?

What fraction of the total number that had been in the bag had he lost or given away?

Hint* work backwards through the clues!

Andy's Marbles

I know that to solve this problem I have to work backwards, beginning with the last part, and ending with the first.

So... Andy walks away with 14 marbles, 2/3 of what was recovered. His friend walks away with 1/3 of what was recovered. 14 is 2/3 so to find out 1/3 I then half 14, getting 7. Sam had 7 and Andy had 14. A total rescued of 14 + 7 = 21
21 is half (1/2) of what was lying around on the ground, the other half having been taken by the children. To find how many were on the ground nearby I have to double 21. I now have an answer of 42.
42 must be doubled to get the final answer, as 1/3 and 1/6 went down drains or hills (1/3 + 1/6 = 1/6 + 2/6 =1/2).
This gives me a final answer of 84 marbles in the bag.
To find out what fraction of the marbles Andy had given away or lost you have to find the fraction of marbles he was left with. He was left with 14 out of 84 marbles (14/84). You then work out the fraction in its lowest form. Firstly divide 14 and 84 by 2 to get 7/42 then divide them by 7 to get an answer of 1/6. However 1/6 is what he is left with so he must have lost or given away 5/6 of his marbles!