

Twenty divided into six an NRICH problem

This activity explained and extended by Liz Gibbs

The Busy Lizzie Maths Library

Twenty divided into six – an NRICH problem

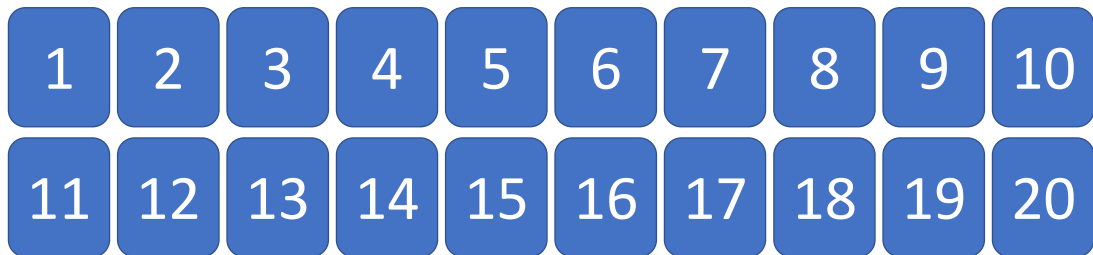
This activity is built around a problem published online by NRICH.

www.nrich.maths.org

The initial problem is quite short but it offers the opportunity, like most maths activities to be extended and promote mathematical thinking.

Let's go...

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Katie had a pack of twenty cards numbered from 1 to 20.

She arranged the cards into six piles.

The number on the cards in each pile added to the same total.

www.nrich.maths.org/1047

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What do we know?

There are 20 cards with the numbers 1 to 20 on them.

We need to put the cards into 6 groups.

All the groups must have the same total.

Possible way forward.

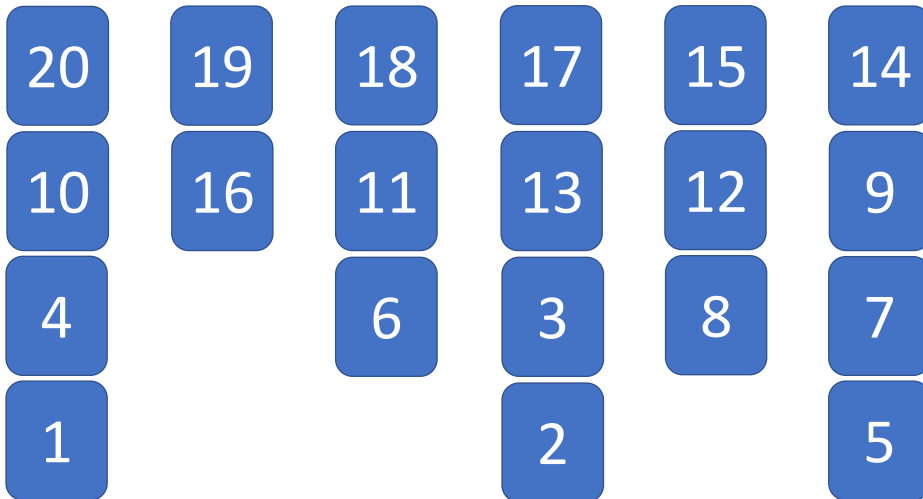
Add the numbers 1 – 20 together ($1 + 2 + 3 \dots$) the total is 210.

6 piles are needed so divide 210 by 6 = 35

Each group must have a total of 35.

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Here is one of many possible solutions

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Once we have worked out how to solve this problem, let's extend it.

Can you put the twenty cards into 2, 3, 4, 5, 6, 7, 8, 9 or 10 groups, where the sum of the group is the same.

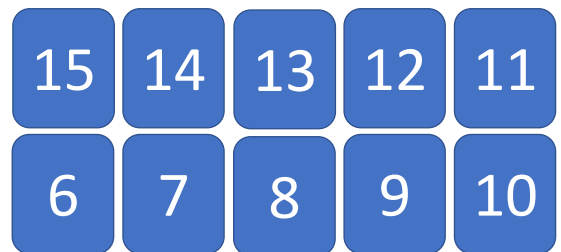
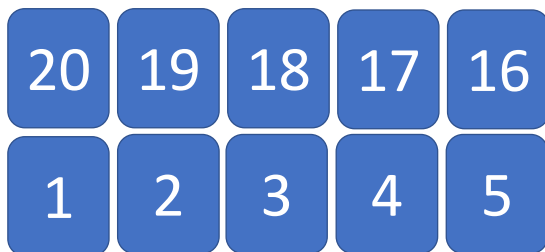
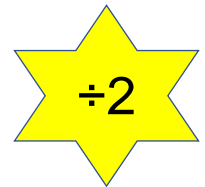
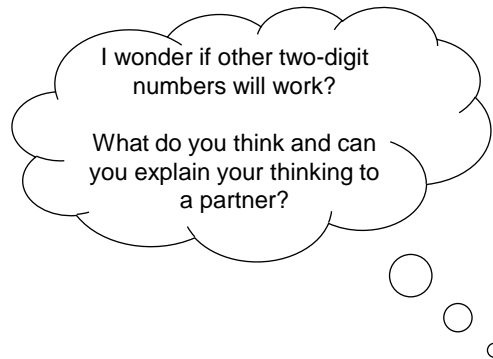
Before starting to rearrange the cards, what step would be useful, so that you are not wasting time?

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Let's do some simple calculations before starting to arrange the cards.

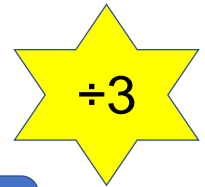
$$\begin{aligned}210 \div 2 &= 105 \checkmark \\210 \div 3 &= 70 \checkmark \\210 \div 4 &= 52.5 \\210 \div 5 &= 42 \checkmark \\210 \div 6 &= 35 \checkmark \\210 \div 7 &= 30 \checkmark \\210 \div 8 &= 26.25 \\210 \div 9 &= 23.33 \\210 \div 10 &= 21 \checkmark\end{aligned}$$



20
17
16
7
10

19 13
1 4
15 3
5 8
2

18
12 14
11 6
9



20
15
7

19
11
9
3

18
12
8
4

17
13
6
5
1

16
14
10
2

