

Twenty divided into six

Twenty divided into six – an NRICH problem

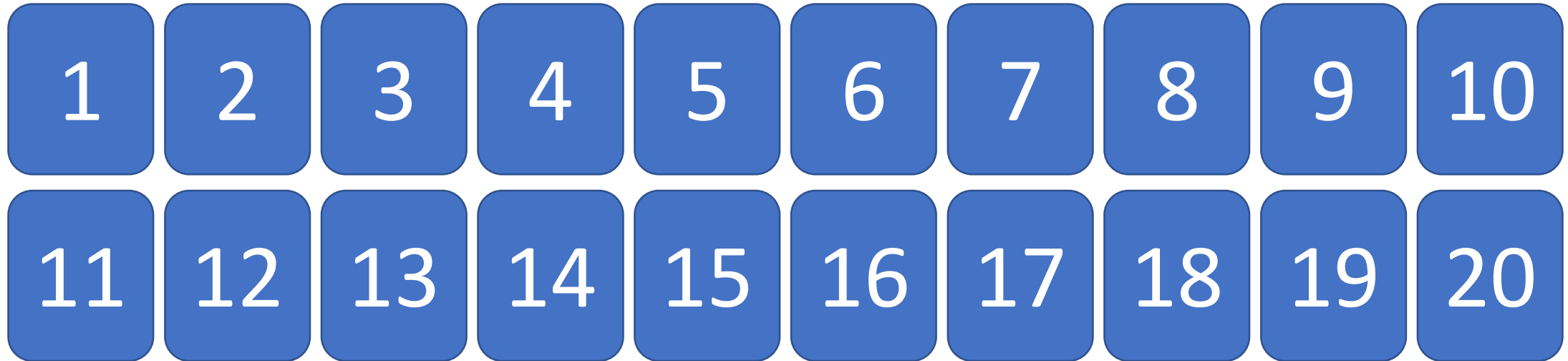
This activity is built around a problem published online by NRICH.

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.

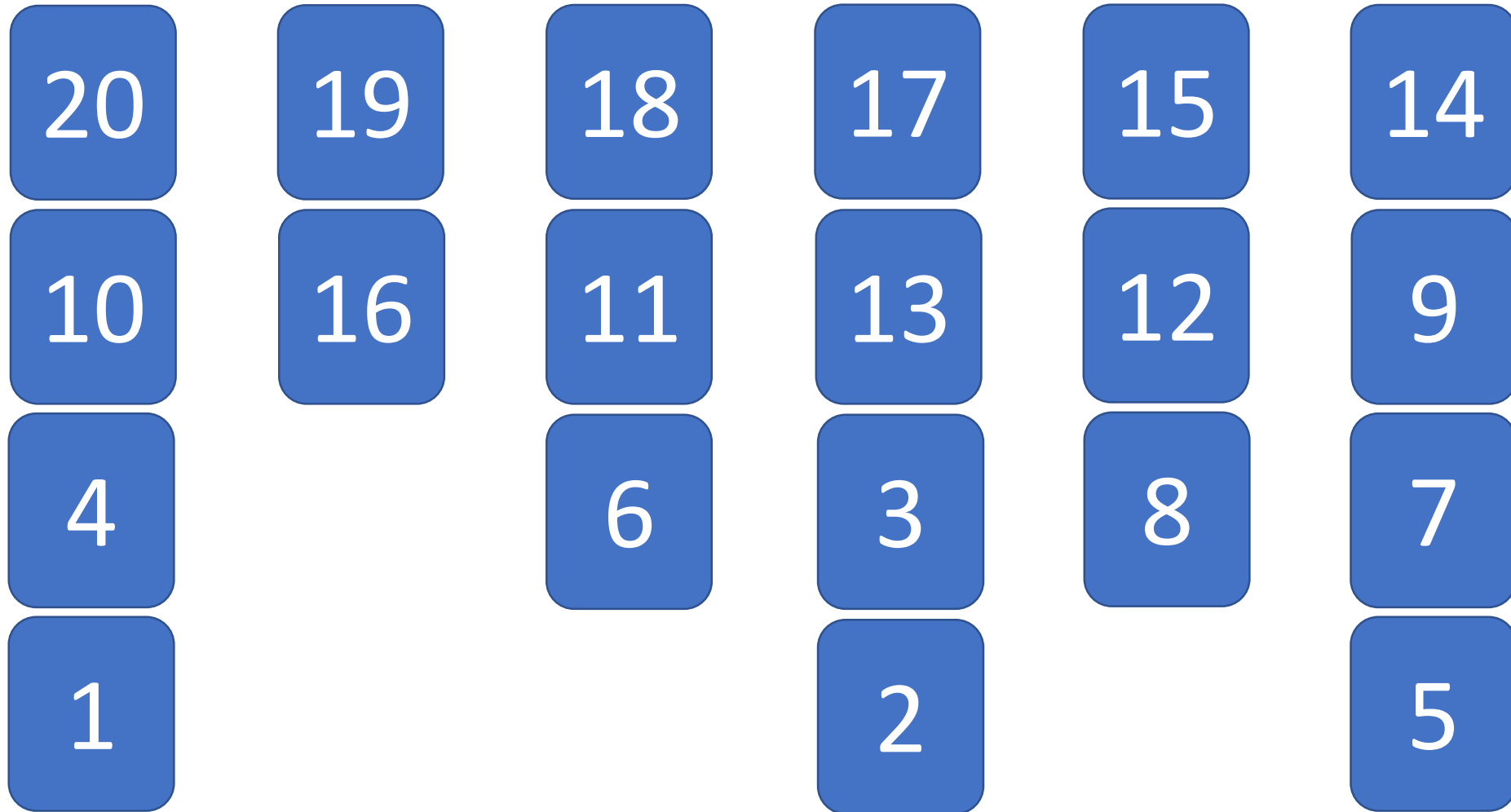
Possible way forward.

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.

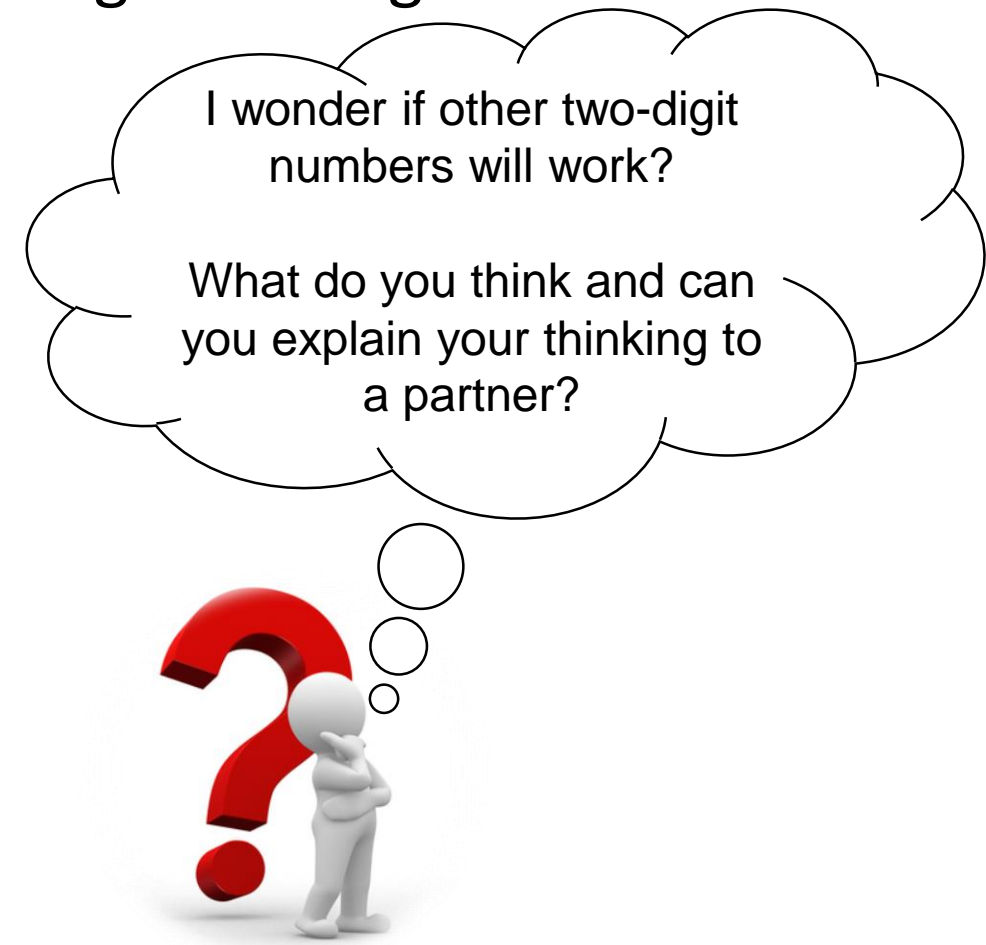
Can you put the twenty cards into 2, 3, 4, 5, 6, 7, 8, 9 or 10 groups, where the sum of the group is the same.

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

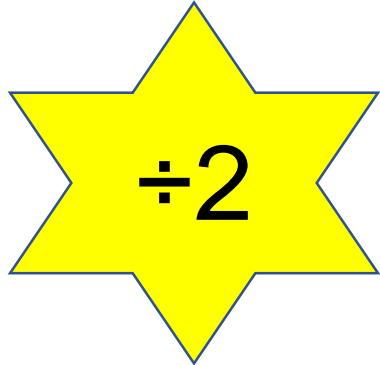
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Let's do some simple calculations before starting to arrange the cards.

$210 \div 2 =$	105	😊
$210 \div 3 =$	70	😊
$210 \div 4 =$	52.5	😞
$210 \div 5 =$	42	😊
$210 \div 6 =$	35	😊
$210 \div 7 =$	30	😊
$210 \div 8 =$	26.25	😞
$210 \div 9 =$	23.33	😞
$210 \div 10 =$	21	😊



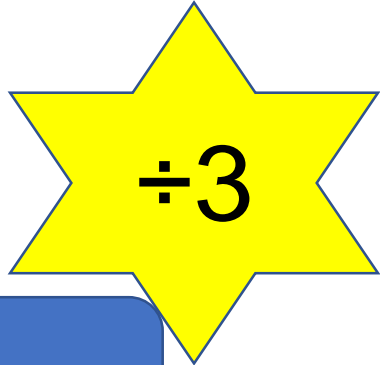
20	19	18	17	16
1	2	3	4	5



15	14	13	12	11
6	7	8	9	10

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

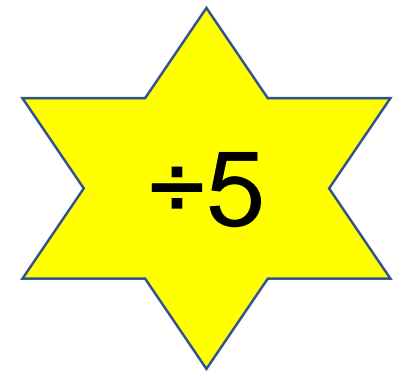
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16

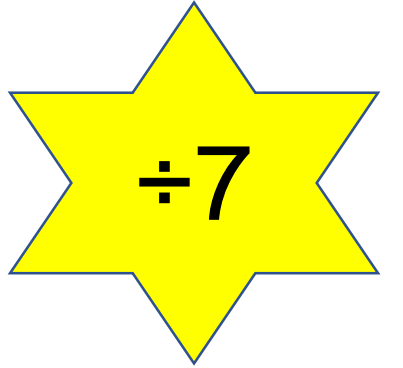
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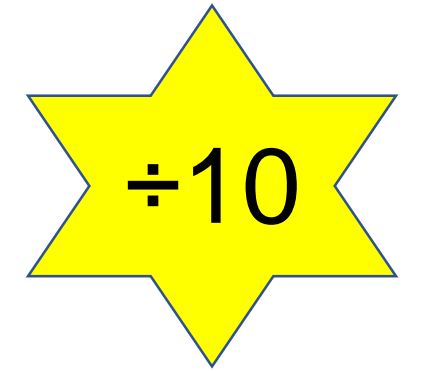
10

2



20	19	18	17	16	15	8
10	11	12	13	14	9	7
					1	6
					3	4
					2	5





20	19	18	17	16	15	14	13	12	11
1	2	3	4	5	6	7	8	9	10