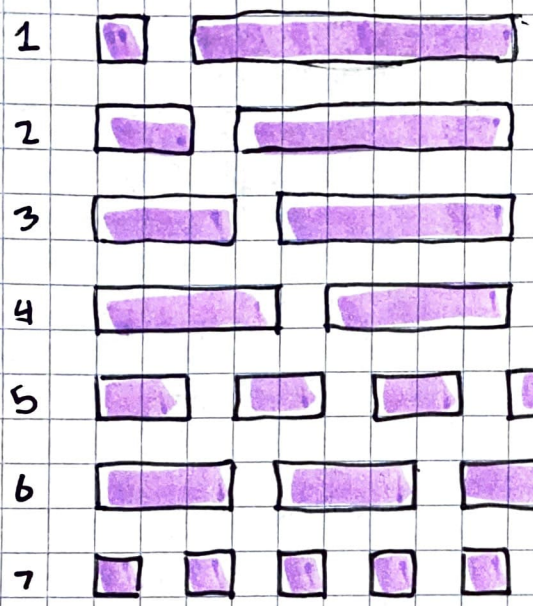
eight cubes



1 + 7 = 8
2 + 6 = 8
3 + 5 = 8
4 + 4 = 8

} 4 ways

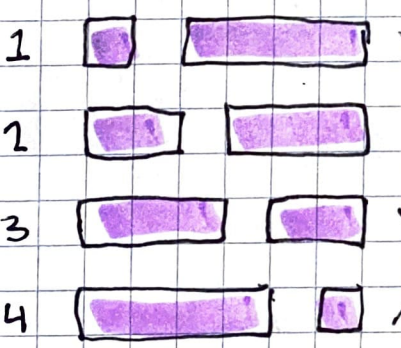
2 + 2 + 2 + 2 = 8
3 + 3 + 2 = 8
1 × 8 = 8

} extra

I noticed that the blocks stoped having new combinations halfway. After 4 + 4 = 8 the next combination just repeated.

I predict for a row of 5 blocks the combinations will stop after 2 + 3 = 5.

five cubes



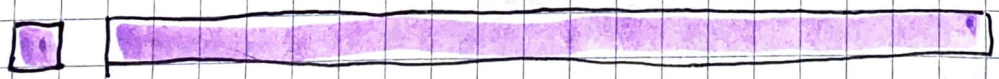
1 + 4 = 5
2 + 3 = 5

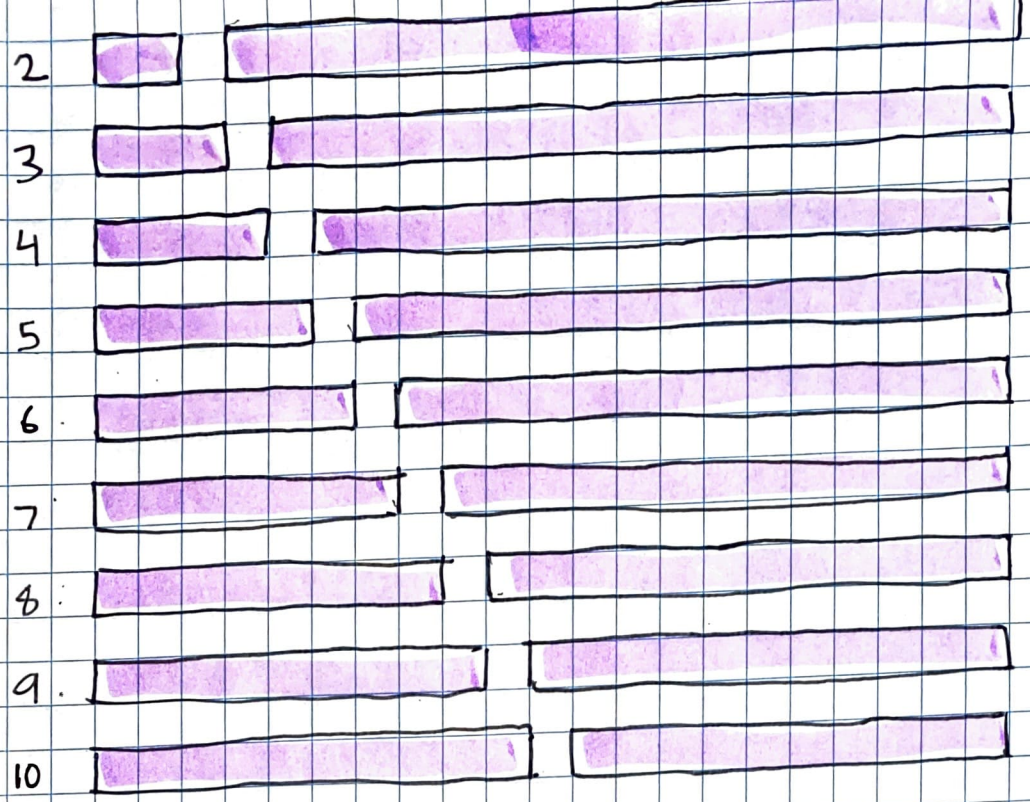
} 2

} will repeat

For 20 cubes I think the patterns will stop at 10 + 10 = 20.

twenty cubes





My noticing is to find the limit or the final way you can split your cubes is: For even numbers you take your number of cubes, 8 lets say and divide that by 2.

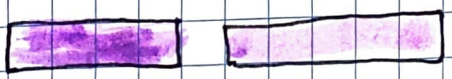
$8 \div 2 = 4 \sim 4 + 4 = 8$

$4 + 4 = 8$ is the max

For odd numbers subtract 1 to make an even number and divide that by two. Then add 1 back to the back number.

$9 - 1 = 8 \sim 8 \div 2 = 4 \sim 4 + 4 = 8 \sim 4 + 5 = 9$

+1



$4 + 5 = 9$ is the max