

FRIDAY

LO: To be able to
simplify information to
solve a problem.

Recap – Identify the multiples of 3 from the following numbers

1. 23
2. 45
3. 27
4. 66
5. 84
6. 33
7. 55
8. 79
9. 13

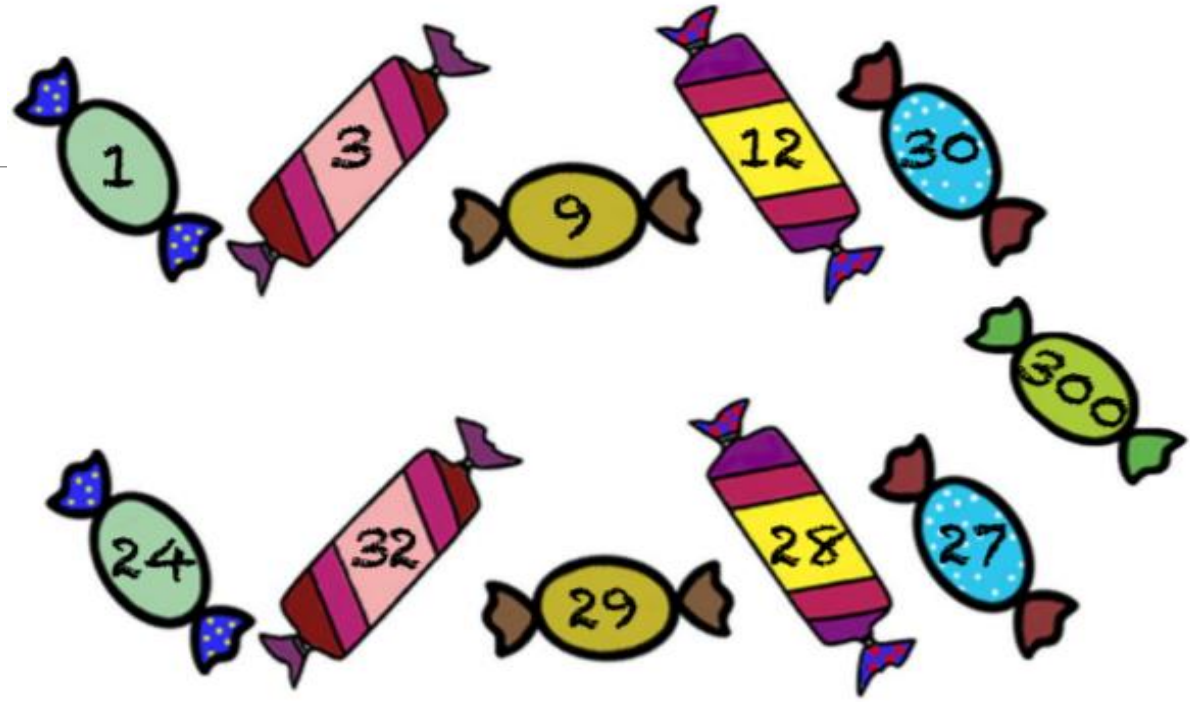
Recap – Identify the multiples of 3 from the following numbers

Answer

1. 23 – Not a multiple of 3
2. 45 = 3 X 15
3. 27 = 3 X 9
4. 66 = 3 X 22
5. 84 = 3 X 28
6. 33 = 3 X 11
7. 55 – Not a multiple of 3
8. 79 – Not a multiple of 3
9. 13 – Not a multiple of 3

Identify

Sweet multiples



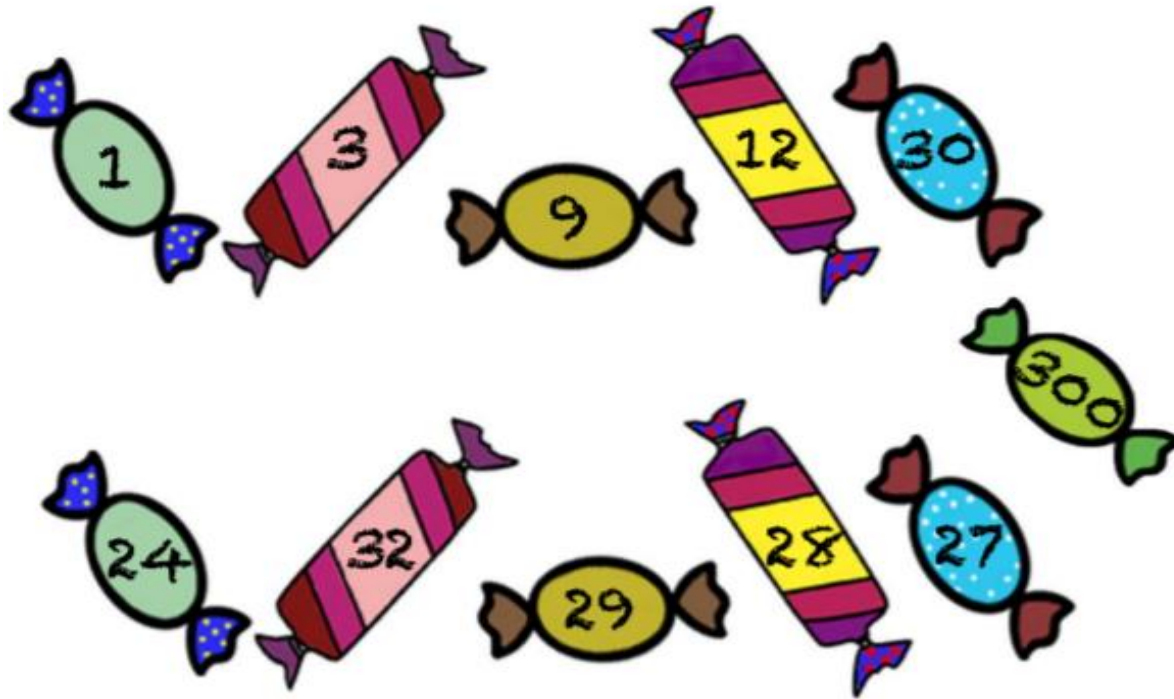
These sweets all have different numbers on them.

- Which of the numbers are multiples of 3?
- Which numbers are both even and a multiple of 3?

Sweet multiples



Answer



These sweets all have different numbers on them.

- Which of the numbers are multiples of 3?
- Which numbers are both even and a multiple of 3?

Multiples of 3

3, 9, 12, 30, 24, 27, 300

Even multiples of 3

12, 30, 24, 300



Simplify

Sweet multiples



Look at these three sweets.

How many ways can you rearrange them to make an odd number?

Sweet multiples



Answer



Look at these three sweets.

How many ways can you rearrange them to make an odd number?

-
1. 123
 2. 321
 3. 213
 4. 231

The sweets can be arranged in the above 4 ways to make an odd number.



Simplify

Sweet multiples



How many ways can we pick 2 sweets from the digits 1-5 ?

Sweet multiples



Answer



How many ways can we pick 2 sweets from the digits 1-5 ?

1. 1 and 2
2. 1 and 3
3. 1 and 4
4. 1 and 5
5. 2 and 3
6. 2 and 4
7. 2 and 5
8. 3 and 4
9. 3 and 5
10. 4 and 5

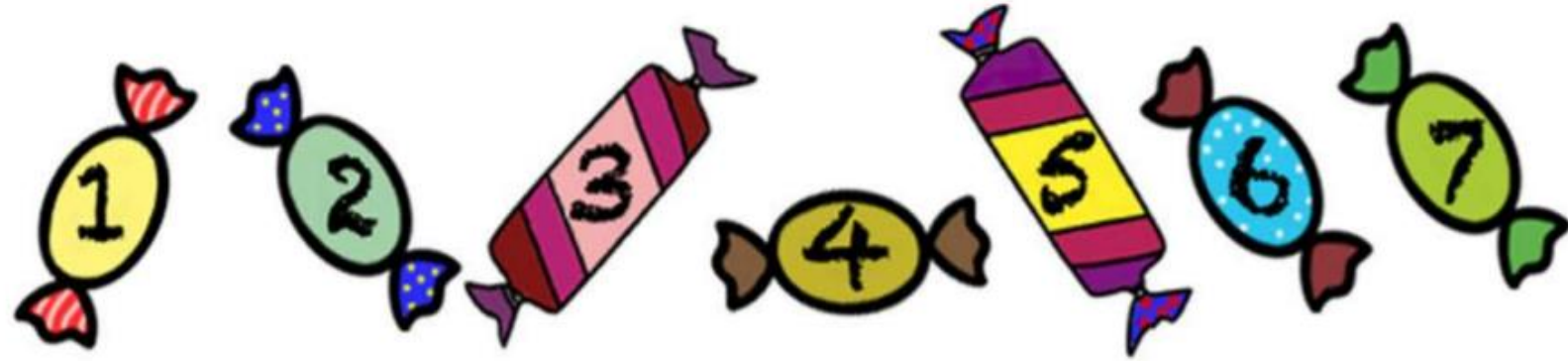
We can pick 2 different sweets in the above 10 ways from the digits 1-5.



TASK

Simplify

Sweet multiples



How many ways can we pick 3 sweets from the digits 1-7 so that the total is an even number?

Solutions

There are 19 ways of choosing 3 numbers that their total is an even number.

First, we can simplify. The maximum total that could be picked is $7+6+5$ which is 18. The minimum total is $1+2+3$ which is 6. So we can only make the even numbers between 6 and 18. These are: 6, 8, 10, 12, 14, 16, 18.

This problem requires a highly systematic approach to ensure that we have found all possible ways of choosing 3 numbers from the numbers 1-7. When this is done is it simply a case of finding the totals and testing to see if they are even. One approach is to list all the ways that we can choose 3 numbers. Let's start by finding all the possibilities for the third number, then the second and finally the first.

All of the possible combinations of 3 numbers are below. There are 35 possible combinations.

Where the total is an even number, they are in red and underlined. Encourage children to work systematically and simplify further if needed.

1-2-3, 1-2-4, 1-2-5, 1-2-6, 1-2-7

1-3-4, 1-3-5, 1-3-6, 1-3-7

1-4-5, 1-4-6, 1-4-7

1-5-6, 1-5-7

1-6-7

3-4-5, 3-4-6, 3-4-7

3-5-6, 3-5-7

3-6-7

5-6-7

2-3-4, 2-3-5, 2-3-6, 2-3-7

2-4-5, 2-4-6, 2-4-7

2-5-6, 2-5-7

2-6-7

4-5-6, 4-6-7

4-5-7

Great opportunity here to reinforce the concept of how to get an even number when adding three numbers:

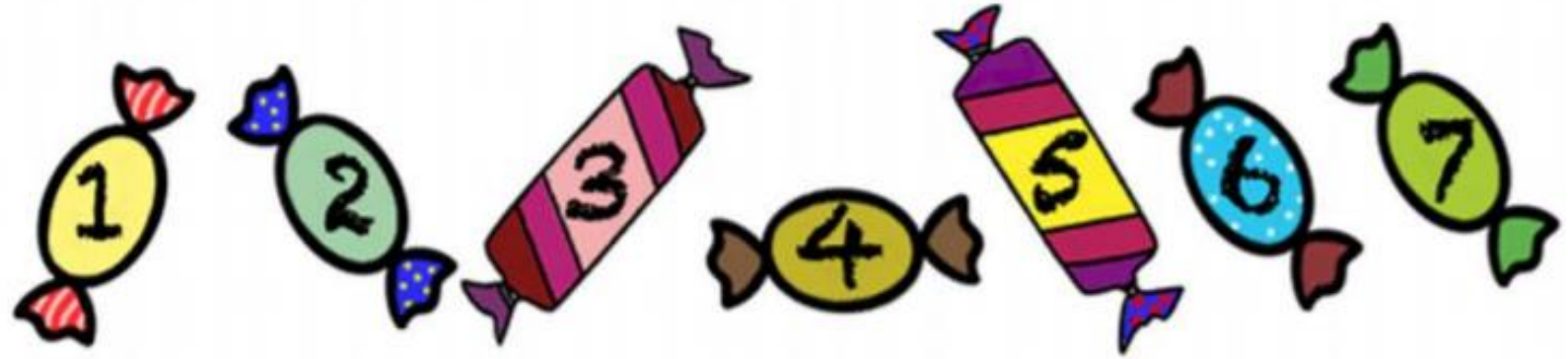
odd + odd + even (in any order) or even + even + even

Answer



Challenge

Sweet multiples



How many ways can we pick 5 sweets from the digits 1-7 so that the total of the 5 numbers is a multiple of 3?