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Look Back

Caz and Ralph are packing some oranges and bananas into bags.

a If each bag has 4 oranges, how many bags does Caz need for 36 oranges? 9 bags

b If each bag has 3 bananas, how many bags does Ralph need for 36 bananas? 12 bags

Explain to a partner how you know.

36 oranges in 9 bags of 4.

36 bananas would be 12 bags of 3.

Thinking Cap

What other ways can they pack the fruits equally into bags with no remainder? What is the same and what is different between the ways? Use counters to help you.

How many ways can you pack the 36 fruits in bags with none left over?

1s, 2s, 3s, 4s, 6s, 9s, 12s, 18s and 36

What is the same and what is different between the ways of packing the fruits?

In some ways, the bags will have many fruits in them.
In other ways, more bags are needed and there are not many fruits in each bag.

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Let's Learn

a Ron has 12 beads. He arranges all the beads in different arrays.

An array is a group of items arranged in equal rows.

1 group of 12 or 12 groups of 1

$12 = 1 \times 12$

12 × 1 = 12 because 1 group of 12 is 12.
Also, 1 × 12 is 12 because 12 groups of 1 is 12

$12 = 2 \times$ 6

2 groups of 6 or 6 groups of 2

6 × 2 = 12 because 2 groups of 6 is 12.
Also, 2 × 6 is 12 because 6 groups of 2 is 12.

12 = 3 × 4

3 groups of 4 or 4 groups of 3

4 × 3 = 12 because 3 groups of 4 is 12.

Also, 3 × 4 = 12 because 4 groups of 3 is 12.

12 can be written as the product of its **factors**.

The factors of 12 are 1, 2, 3, 4, 6 and 12.

Factors are numbers that divide another number exactly, with no remainder.

Factors

- 1, 2, 3, 4, 6 and 12 are called factors of 12.
- 1 and 12, 2 and 6, 3 and 4 are called factor pairs of 12 because the product of each pair is 12.

What are the other numbers from 1 to 12 that are not factors of 12?

5, 7, 8, 9, 10 and 11

1 and 12 are **factor pairs** of 12 because they multiply to give 12.

2 and 6 are also factor pairs of 12 because $2 \times 6 = 12$.

Every number has factors of 1 and itself.
What are the factors of 30?

30 has 4 factor pairs as shown below.
$30 = 1 \times 30$
$30 = 2 \times 15$
$30 = 3 \times 10$
$30 = 5 \times 6$
The factors of 30 are 1, 2, 3, 5, 6, 10, 15 and 30.

What are the first 9 multiples of 4? How do you know?

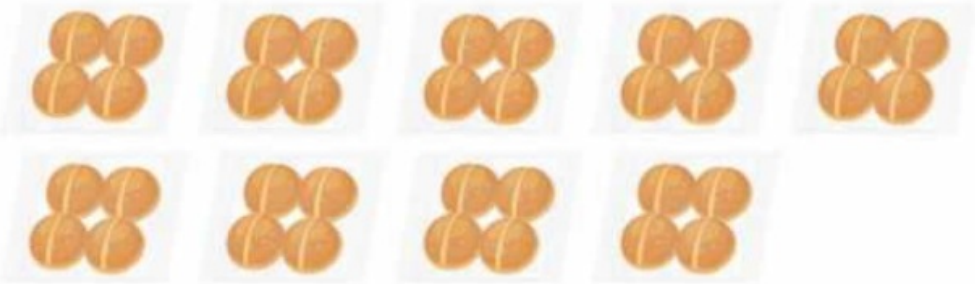
4, 8, 12, 16, 20, 24, 28, 32, 36.
We counted the groups of 4, so these numbers are the first 9 multiples of 4.

Are these the only multiples of 4? How do you know?

No, we can find more multiples of 4 by continuing to count 4 more.

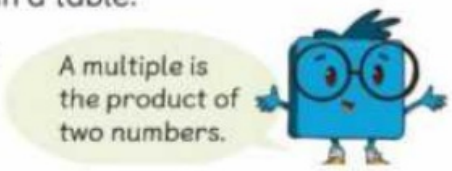
b At a bakery, buns are put into packets of 4.

Izzy wants to find out how many buns there are in all.



She counts in 4s and records these numbers in a table.

These numbers are the first 9 **multiples** of 4.



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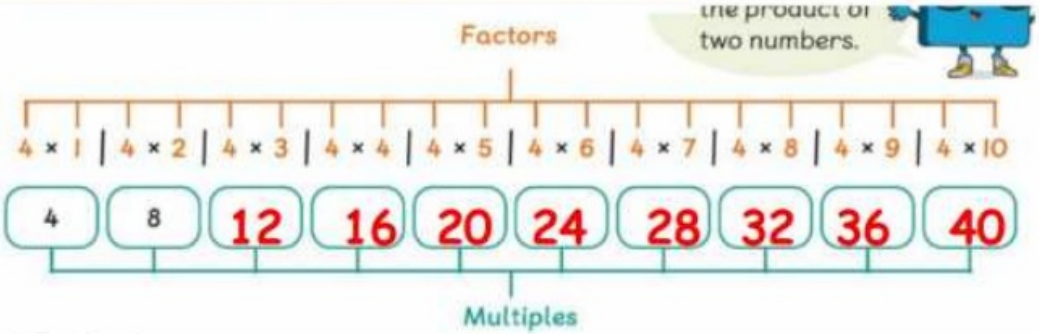
The first 9 multiples of 4 are: 4, 8, 12, 16, 20, 24, 28, 32 and 36. The next multiple is 40.

the product of two numbers.



$36 = 9 \times 4$

36 is a multiple of 4 and 9.

$36 \div 4 = 9$ and $36 \div 9 = 4$

36 can be divided by 4 and 9 with no remainder.

Do the multiples of 4 stop at 36? What comes next?

Izzy says that 4 is a factor of all multiples of 4. Is she correct?

4 has many other multiples, such as, 44, 56, 80, 100 and 400. The product of 4 and any whole number is a multiple of 4.

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Let's Practise

1 The first 10 multiples of 5 are 5, 10, 15, 20, 25, 30, 35, 40, 45 and 50.

What pattern do you see in the multiples of 5? They all end with 0 or 5.

Is 132 a multiple of 5? Make a statement about all multiples of 5.

No. It doesn't end with 0 or 5. All mulitples of 5 end with 0 or 5.

2 Ron uses each card only once to form 4-digit numbers.

2	5	9	3

a What is the greatest multiple of 5 he can form? 9325

b What is the smallest multiple of 5 he can form? 2395

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3 **a** Circle the factors of 50.

1	2	3	5	7	15	20	24	35	50

b Which factors of 50 are missing? **10 and 25**

c Caz says, "I think all the factors of 50 are also multiples of 5."
Is her guess correct? How do you know?

No, 1 and 2 are factors of 50 but are not multiples of 5.

4 Sally makes the following guess:

> 6 has factors 1, 2, 3 and 6.
> 12 has factors 1, 2, 3, 4, 6 and 12.
> 12 is greater than 6, so it has more factors.
> The greater the number, the more factors it will have.

Do you think Sally's guess is correct? Explain why.

No, I don't agree with Sally, just because a number is greater, it doesn't mean that it has more factors.
For example 6 has 4 factors: 1, 2, 3 and 6
while 11 has only 2 factors: 1 and 11