

Factor pairs

Notes and guidance

In this small step, children are introduced to factors for the first time. They learn that when they multiply two whole numbers to give a product, both the numbers that they multiplied together are factors of the product. For example, $3 \times 5 = 15$, so 3 and 5 are factors of 15. 3 and 5 are also referred to as a “factor pair” of 15

They then generalise this further to conclude that a factor of a number is a whole number that divides into it exactly.

Children create arrays using counters to develop their understanding of factor pairs. It is important for children to work systematically when finding the factor pairs of a number in order to ensure that they find all the factors. For example, when finding factor pairs of 12, begin with 1×12 , then 2×6 , 3×4 . At this stage, children should recognise that they have already used 4 in the previous calculation, therefore all factor pairs have been identified.

Things to look out for

- Children may not work systematically, meaning that they could miss some factor pairs.
- Children may find it difficult to understand why not all factors come in pairs, for example $4 \times 4 = 16$, so this only gives 1 factor of 16, not 2

Key questions

- How can you use arrays to help you find all the factors of a number?
- How do you know that you have found all the factors of _____?
- How do arrays help you to see when a number is not a factor of another number?
- Which number is a factor of every whole number?
- Do factors always come in pairs?
- Do whole numbers always have an even number of factors?

Possible sentence stems

- _____ = _____ \times _____, so _____ and _____ are a factor pair of _____
- _____ has _____ factors altogether.

National Curriculum links

- Recognise and use factor pairs and commutativity in mental calculations

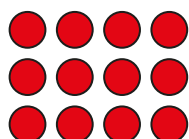
Factor pairs

Key learning

- Complete the factor pairs of 12 and the sentences.

 $1 \times \underline{\quad} = 12$

 $\underline{\quad} \times 6 = 12$

 $\underline{\quad} \times \underline{\quad} = 12$

12 has $\underline{\quad}$ factor pairs.

12 has $\underline{\quad}$ factors altogether.

- Use counters to create arrays and find the factor pairs for each number.

18

24

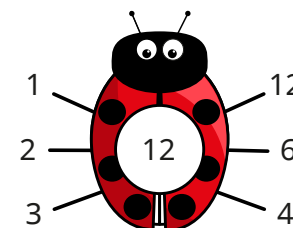
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- Which of these numbers are factors of 20?

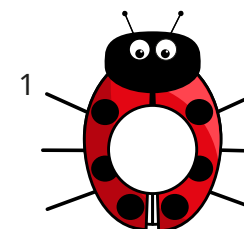
2 3 5 8 10 15

Use cubes or counters to show how you know.

- Here is a factor bug for 12



Complete the factor bug for 20



- Draw a factor bug for each number.

48

35

16

56

Which of the numbers has an odd number of factors?

Can you find another number with an odd number of factors?

- Find all the factor pairs of 60

Factor pairs

Reasoning and problem solving



The greater the number, the more factors it has.

Is Tommy correct?

Use arrays to explain your answer.



No
multiple possible answers, e.g.
15 has 4 factors
and 17 has 2 factors

Is the statement always true, sometimes true or never true?



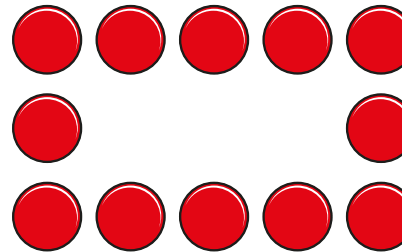
An odd number has an odd number of factors.

sometimes true

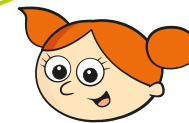
Explain your answer to a partner.



Alex has made an array using 12 counters.



5 and 3 are a factor pair of 12



No

Do you agree with Alex?

Explain your answer.

