


### Multiplication Prior Learning Assessment Question 4:

**Objective:** I can find factor pairs of numbers.

**NC: NMD 3:** recognise and use factor pairs and commutativity in mental

#### Assessment Question:

Prior Learning:

	<b>Question 4:</b> I can find factor pairs of numbers.	I feel
Write the factor pairs for each number below:		
<div style="text-align: center;"><div style="border: 1px solid purple; border-radius: 10px; padding: 5px; width: 40px; margin: 0 auto;">6</div><div style="display: flex; justify-content: space-around; margin-top: 10px;"><div style="border: 1px solid blue; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center;"><div style="border: 1px solid blue; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center;">x</div></div><div style="border: 1px solid blue; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center;"><div style="border: 1px solid blue; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center;">x</div></div></div><div style="display: flex; justify-content: space-around; margin-top: 10px;"><div style="border: 1px solid blue; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center;"><div style="border: 1px solid blue; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center;">x</div></div><div style="border: 1px solid blue; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center;"><div style="border: 1px solid blue; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center;">x</div></div></div></div>	<div style="text-align: center;"><div style="border: 1px solid purple; border-radius: 10px; padding: 5px; width: 40px; margin: 0 auto;">14</div><div style="display: flex; justify-content: space-around; margin-top: 10px;"><div style="border: 1px solid blue; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center;"><div style="border: 1px solid blue; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center;">x</div></div><div style="border: 1px solid blue; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center;"><div style="border: 1px solid blue; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center;">x</div></div></div><div style="display: flex; justify-content: space-around; margin-top: 10px;"><div style="border: 1px solid blue; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center;"><div style="border: 1px solid blue; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center;">x</div></div><div style="border: 1px solid blue; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center;"><div style="border: 1px solid blue; width: 15px; height: 15px; display: flex; align-items: center; justify-content: center;">x</div></div></div></div>	

#### Teacher Input Ideas:

Give the children 6 counters or objects. Ask the children to explore different equal groups they can make with 6. Explore that the children can make 2 groups of 3 or 3 groups of 2. How will we write this as a sum. Explore the 2 ways these can be written and take about commutativity from previous lesson. Then explore the other group is 1 and 6 or 6 groups of 1. How would we write this as a sum?

Introduce the word factor to the children. What does this mean? Discuss the meaning of factor and multiple. Explain that 6 is a multiple of 2 and 3 and the 2 and 3 are factors of 6. Are there any other factors for 6? Discuss that the factor pairs for 6 are 1 and 6 and 2 and 3.

Now repeat with the numbers 9 and 16 . Encourage the children to use objects or drawings to help them to find the factor pairs. Some children may be ready to apply their knowledge of timetables. Model how to check that they have all factor pairs by working in order to check. Such as making 1 group of 16. Then 16 groups of 1, so my first factor pair is 1 and 16. Can I split the amount into 2 groups? Yes, I can make 2 groups or 8 or 8 groups of 2. Can I split 16 into groups of 3? No, so 3 is not a factor of 16. Can I make groups of 4? Yes, so 4 and 4 are factors pairs of 16.

## Practice Activities

**Purple Practice:** Most suited for children who show difficulty in answering Question 4 of prior learning assessment and will benefit from exploring factor pairs practically.

Practical: For this activity provide the children with objects or counters to use and number cards such as 2,4,6,10,12,14, 15 , 16 , 18.

The children should explore the different arrays that they can make. Encourage the children to start with making 1 group, then 2 groups, then 3 groups to explore finding all of the factor pairs for each number. Photos of the arrays the children have made can be taken to record their learning and then the children may want to write sentences about the factor pairs they have made for each number.

**Green Practice:** Most suited for children who made errors in Question 4 of the Prior Learning assessment and will benefit from exploring factor pairs using images to support their learning.

For this activity children are presented with numbers to 18 to find factor pairs. The children are provided with images to support them and some support is provided with examples in the first questions. The children are required to complete the number sentences to help them to find the factor pairs for each amount. The activity is spread over 2 sheets.

**Yellow Practice:** Most suited for children who demonstrate some understanding in Question 4 of the prior learning and are ready to explore factor pairs using their knowledge of times tables.

The children are provided with different numbers to 30. They are to find all factor pairs of each amount and write these on the blocks provided. In the first 4 questions, the children are given some support as they are provided with one factor in each factor pair. The blocks are also positioned so that the children work in order to ensure that they find each factor pair.

## **Mastery 1 :Fluency**

For this mastery problem the children are presented with a jigsaw design that needs to use 36 pieces. The children are to apply their knowledge of factors to work out how many different ways the jigsaw can be presented and how the rows can be arranged. The children should discuss the different combinations and talk about their knowledge they have used. When the children have found all factors of 36, the children can then

explore the challenge question where the children are to work out if a jigsaw with 24 pieces or a jigsaw with 36 pieces will have more combinations.

### **Mastery 2: Investigation:**

For this mastery task the children are presented with a statement to explore and decide if it is true or false. The children are to decide if even numbers or odd numbers have more factor pairs.

#### **Key questions/ ideas:**

- Ask the children for ideas as to how they will prove if this is true or false. Where are they going start?
- How will they record their findings?
- Which numbers will they choose to use ? Why?
- How many different numbers will they need to explore to prove if it is true or false?
- What do they notice as they are exploring odd and even numbers?

### **Answers :**

#### **Green:**

- 1)  $1 \times 6$  and  $2 \times 3$
- 2)  $1 \times 8$  and  $2 \times 4$
- 3)  $1 \times 10$  and  $2 \times 5$
- 4)  $1 \times 12$  and  $2 \times 6$  and  $3 \times 4$
- 5)  $1 \times 15$  and  $3 \times 5$
- 6)  $1 \times 18$  and  $2 \times 9$  and  $3 \times 6$

#### **Yellow:**

- a) 1 and 6    2 and 3
- b) 1 and 8    2 and 4
- c) 1 and 12    2 and 6    3 and 4
- d) 1 and 15    3 and 5
- e) 1 and 24    2 and 12    3 and 8    4 and 6
- f) 1 and 30    2 and 15    3 and 10    5 and 6

**Mastery1:**

1 and 36

2 and 18

3 and 12

4 and 9


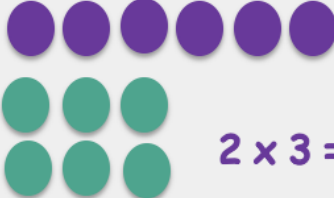
6 and 6


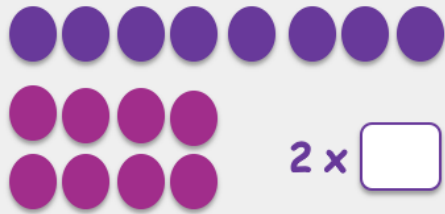
**Challenge:**




36 has 5 factor pairs





24 has 4 factor pairs.

Find the factor pairs for each number.


1)    $1 \times 6 = 6$   
 $2 \times 3 = 6$  The number 6 has 2 factor pairs.  
 The factors are 1, 2, 3 and 6

2)    $1 \times \square = 8$   
 $2 \times \square = 8$  The number 8 has  factor pairs.  
 The factors are

3)    $\square \times \square = 10$   
  $\square \times \square = 10$   
 The number 10 has  factor pairs.  
 The factors are

4)    $\square \times \square = 12$   
  $\square \times \square = 12$   
  $\square \times \square = 12$   
 The number 12 has  factor pairs.  
 The factors are

Find the factor pairs for each number.

5)    ×  = 15

  ×  = 15

The number 15 has  factor pairs.

The factors are

6)  

×  = 18

  ×  = 18

  ×  = 18

The number 18 has  factor pairs.

The factors are


**Challenge:** find all factor pairs for 20.

Yellow Activity

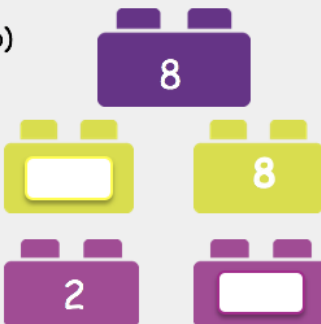
LO: I can find factor pairs of numbers using my times tables.

Look at the number on the purple block. Find all the factors pairs of this number. Some have been found to help you.

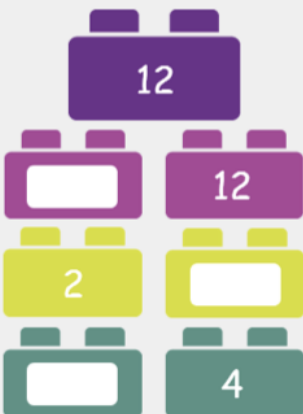
a)



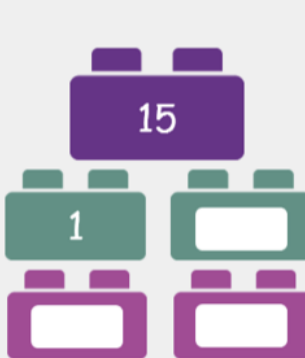
b)



c)




d)



e)



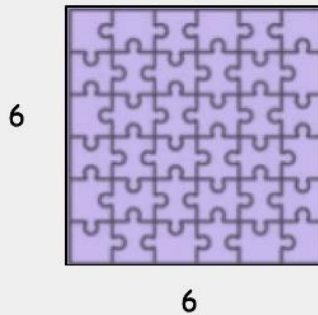
f)



Challenge: Can you find all the factors pairs of 18? How do you know that you have found all of them?

I would like to design a jigsaw that uses 36 pieces.

Find as many different ways you can as to how the pieces can be organised in to rows.



How many different ways can you find?

Challenge: Are there more combinations if I made a jigsaw using 24 pieces or using 36 pieces?





Even numbers have more factor pairs than odd numbers.

Explore this statement. Is this true? How will you prove your point of view?

