

Diving into Mastery



# Factor Pairs

# Diving into Mastery Guidance for Educators

Each activity sheet is split into three sections, diving, deeper and deepest, which are represented by the following icons:



Diving



Deeper



Deepest

These carefully designed activities take your children through a learning journey, initially ensuring they are fluent with the key concept being taught; then applying this to a range of reasoning and problem-solving activities.

These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.

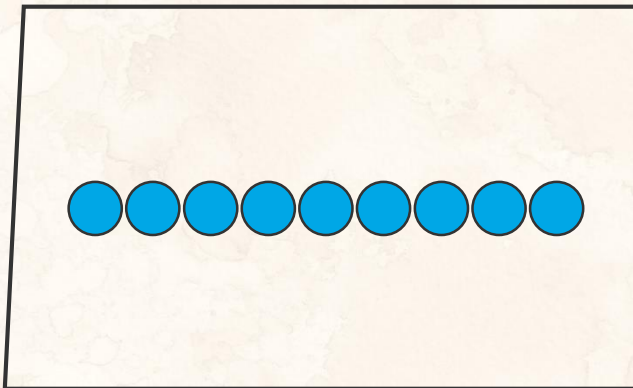
# Aim

- Recognise and use factor pairs and commutativity in mental calculations.



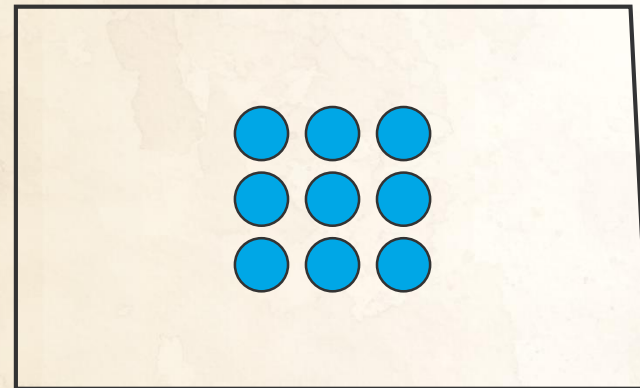
Find the two factor pairs for 9.  
Show the arrays to match each factor pair.

Array 1



Factor Pair:  and

Array 2



Factor Pair:  and



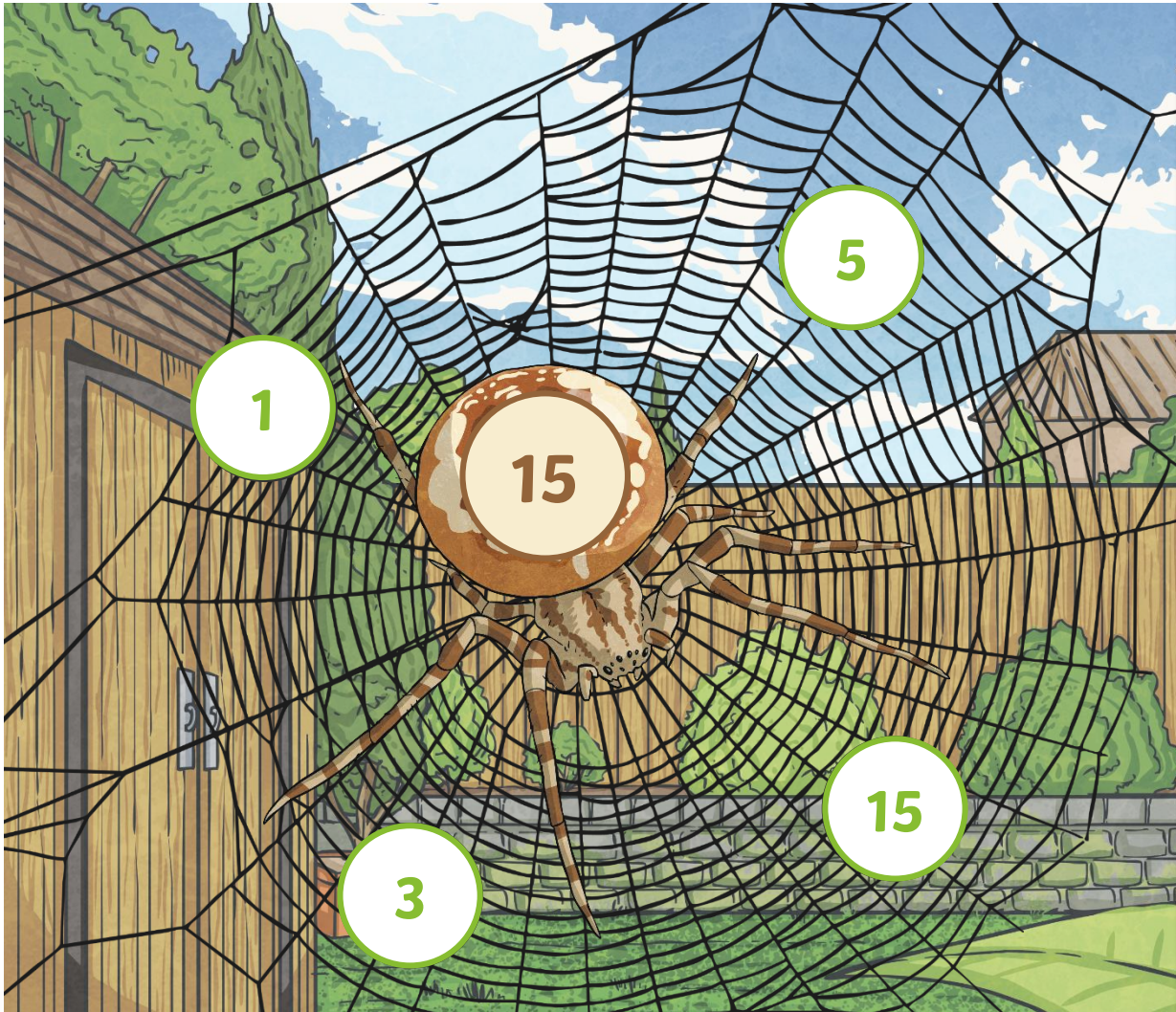
Circle all the numbers that are **not** factors of 30.

1	2	3	4	5
6	7	8	9	10

Find two more factors for 30 that are not in the list above.

15

30



Find the factors of 15 to complete the factor spiderweb.



Read the statement below. Is it true or false? Explain your answer.

which factor pair is the odd one

Products will always have an even number of factors.

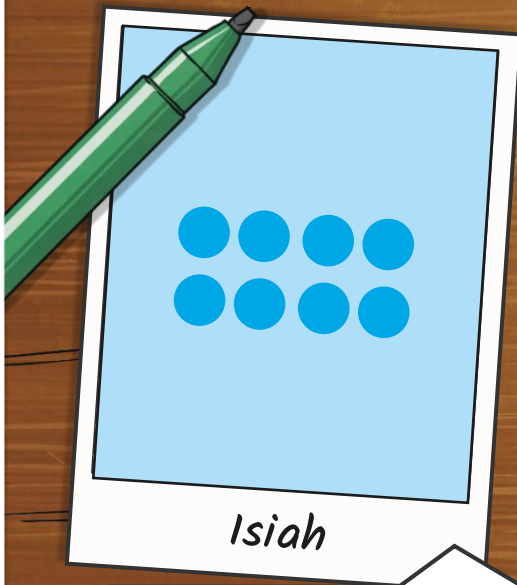
2 and 28

7 and 8

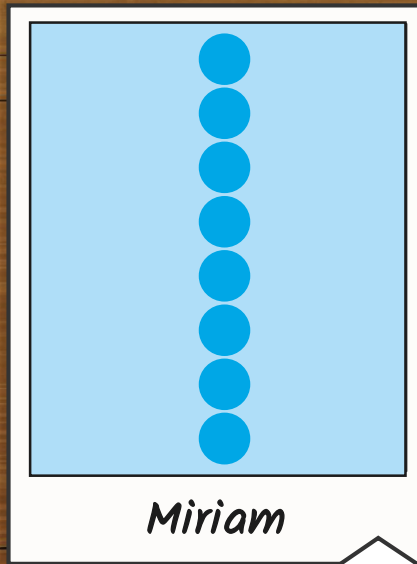
**5 and 11** is the odd one out. All the other factor pairs have a product of 56, but the factor pair of 5 and 11 has a product of 55.



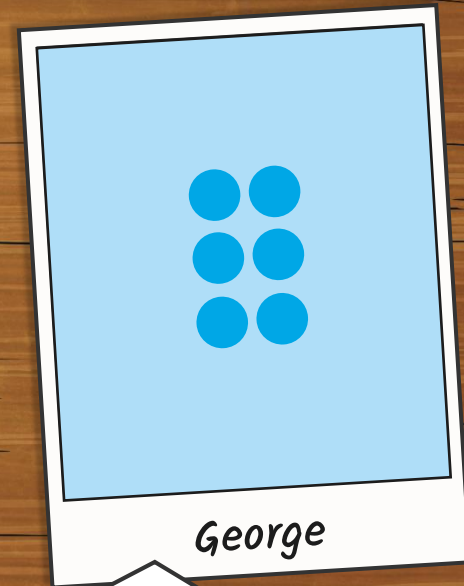
I agree with Isiah and Miriam because their numbers are both factor pairs for 8 so will create arrays with even rows and columns. I disagree with George because 3 and 2 is not a factor pair for 8. 3 rows with 2 in each row creates an array of 6.

*Isiah*

You can make an array that has 2 rows with 4 in each.

*Miriam*

You can make an array that has 1 column of 8.

*George*

You can make an array that has 3 rows with 2 in each.





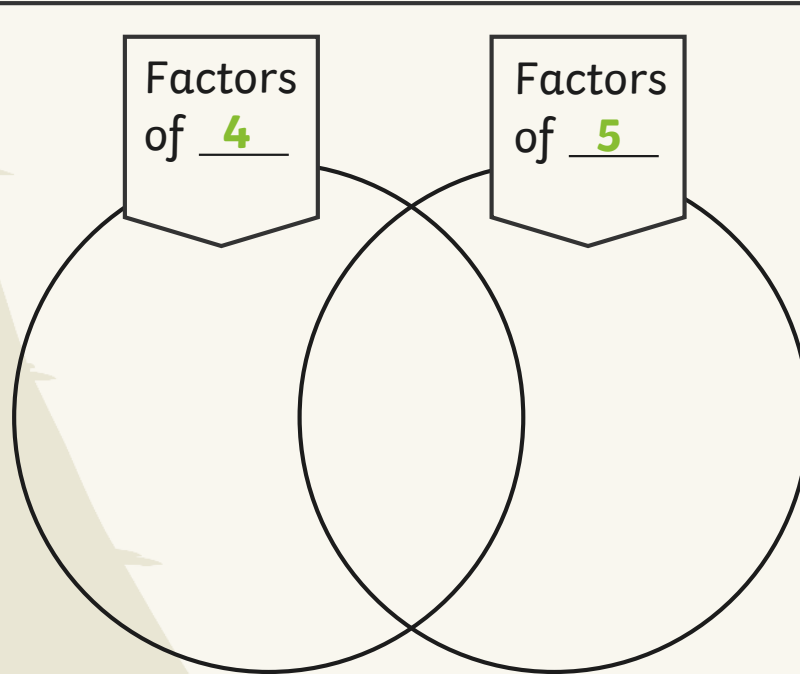
Sort the number

There are many possible answers. Here is one example. Sort the number using your knowledge of factors.



Factors  
of 4

Factors  
of 5





I am a multiple of 5 and one of my factors is 4.

40

I have four tens and one of my factors is 7.

42

One of my factors is 10.

40

30

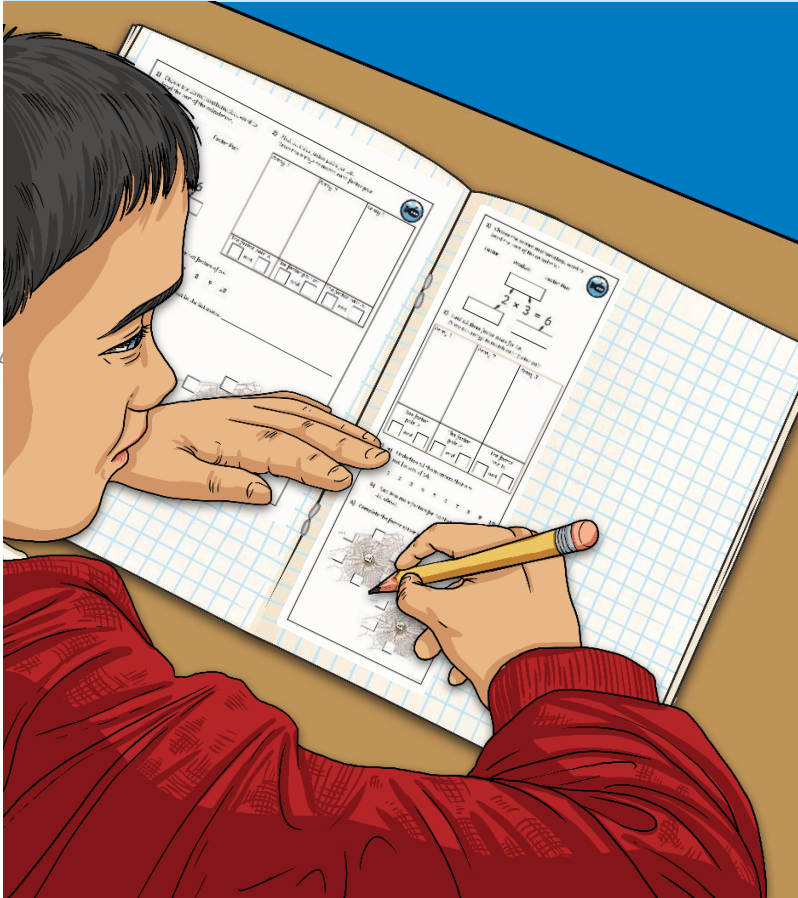
Number	Factor
30	1, 2, 3, 5, 6, 10, 15, 30
40	1, 2, 4, 5, 8, 10, 20, 40
42	1, 2, 3, 6, 7, 14, 21, 42

There are three numbers between 25 and 45 that have 8 factors.

Use these clues to identify each number. Then, in the table, list all 8 factors of each number that you have found.

# Factor Pairs

Dive in by completing your own activity!



1) Sort the factors. Explain.

Number factors

2) Here is a spider web. Can you find the factors of 120 and 180?

3) The child has drawn spider webs. Who do you think has the most factors? Explain.

You can use the spider web to help you.

1) Read the statement and explain. **Statement:** 1 is a factor of every number. **Explain:**

1) Choose the correct mathematical word to label the part of the calculation.

Factor	Product	Factor Pair
<input type="text"/>	<input type="text"/>	<input type="text"/>

$$\begin{array}{c} \downarrow \quad \downarrow \\ 2 \times 3 = 6 \\ \downarrow \quad \downarrow \\ \square \quad \square \end{array}$$

2) Find all three factor pairs for 16. Draw the arrays to match each factor pair.

Array 1	Array 2	Array 3
<input type="text"/>	<input type="text"/>	<input type="text"/>

The factor pair is:  and     The factor pair is:  and     The factor pair is:  and

3) a) Underline all the numbers that are not factors of 64.

1   2   3   4   5   6   7   8   9   10

b) Find two more factors for 64 that are not in the list above.

4) Complete the factor spider webs.

# Need Planning to Complement this Resource?

## National Curriculum Aim

Recognise and use factor pairs and commutativity in mental calculations.

For more planning resources to support this aim, [click here](#).

This screenshot shows a digital resource with three main panels. The left panel, 'Arrays 2', features a grid of blue and red dots and lists multiplication and division problems:  $6 \times 3 = 18$ ,  $3 \times 6 = 18$ ,  $18 \div 6 = 3$ ,  $18 \div 3 = 6$ ,  $7 \times 3 = 21$ ,  $3 \times 7 = 21$ ,  $21 \div 7 = 3$ , and  $21 \div 3 = 7$ . The middle panel, 'Inverse Operations', has a play button icon and text: 'Multiplication and division are inverse operations. What does this mean?' and 'An inverse operation reverses the effect of another operation, for example if you divide 20 by 4, you get 5. If you perform the inverse calculation and multiply 5 by 4, you get back to 20.  $4 \times 5 = 20$ '. The right panel, 'Inverse Operations', includes a recycling symbol and text: 'Multiplication and division are inverse operations. What does this mean?' and 'An inverse operation reverses the effect of another operation, for example if you divide 20 by 4, you get 5. If you perform the inverse calculation and multiply 5 by 4, you get back to 20.  $4 \times 5 = 20$ '. Below these panels are two worksheets: 'Multiplication and Division: Inverse Operations' and 'Inverse Operations Treasure Hunt'.

This screenshot shows a digital resource with three main panels. The left panel, 'Find the Factors', has a play button icon and text: 'To find the factors of a number, you need to find all the pairs of numbers that multiply together to make the product. Can you find all the factors of these numbers?' and lists numbers 12, 18, 20, 24, 28, 30, 32, 36, 40, 42, 48, 50, 54, 56, 60, 63, 64, 70, 72, 75, 80, 84, 88, 90, 96, 100, 105, 108, 112, 114, 116, 120, 126, 128, 132, 135, 140, 144, 147, 150, 156, 160, 162, 168, 170, 174, 176, 180, 182, 186, 189, 192, 196, 200, 204, 210, 216, 220, 224, 228, 231, 234, 238, 240, 246, 250, 252, 256, 260, 264, 270, 273, 276, 280, 282, 286, 288, 290, 294, 297, 300, 306, 310, 312, 315, 318, 320, 324, 328, 330, 336, 340, 342, 346, 348, 350, 354, 357, 360, 364, 368, 370, 374, 378, 380, 384, 388, 390, 396, 400, 404, 408, 410, 414, 418, 420, 426, 430, 432, 436, 440, 444, 448, 450, 456, 460, 464, 468, 470, 474, 478, 480, 486, 490, 492, 496, 500, 504, 508, 510, 516, 520, 524, 528, 530, 534, 538, 540, 546, 550, 552, 556, 560, 564, 568, 570, 576, 580, 584, 588, 590, 594, 598, 600, 606, 610, 612, 616, 620, 624, 628, 630, 636, 640, 644, 648, 650, 654, 658, 660, 666, 670, 674, 678, 680, 686, 690, 692, 696, 700, 704, 708, 710, 714, 718, 720, 726, 730, 732, 736, 740, 744, 748, 750, 756, 760, 764, 768, 770, 774, 778, 780, 786, 790, 792, 796, 800, 806, 810, 812, 816, 820, 824, 828, 830, 836, 840, 844, 848, 850, 854, 858, 860, 866, 870, 874, 878, 880, 886, 890, 892, 896, 900, 906, 910, 912, 916, 920, 924, 928, 930, 936, 940, 944, 948, 950, 954, 958, 960, 966, 970, 974, 978, 980, 986, 990, 992, 996, 1000. The middle panel, 'Factors', has a play button icon and text: 'Factors'. The right panel, 'Factors Venn Diagram', has a play button icon and text: 'Do you? There are some mistakes on this Venn Diagram. Can you spot them? Can you explain why they are incorrect?' and shows a Venn diagram with two overlapping circles labeled 'Factors of 12' and 'Factors of 20'. Below these panels are two worksheets: 'Multiplication and Division: Factors' and 'Factors'.

