L.O. To understand factors.

Please watch this clip to revise our work on factors.

BBC Bitesize Factors

These two videos show two different methods we have used to find factors.
Use the method you find the easiest.

YouTube Finding Factors Using Factor Bugs

YouTube Finding Factors Using Multiplication

Your task today is to choose one of the methods from above to complete
Section A. For an extension task you can move on to Section B.

You may also need a copy of
a times table grid to help
you find the factors of
these numbers.

Multiplication Table

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

A

Copy and complete the second factor in each pair.

1. 16 → 2 and ☐
2. 35 → 7 and ☐
3. 44 → 11 and ☐
4. 27 → 3 and ☐

5. 40 → 5 and ☐
6. 24 → 8 and ☐
7. 90 → 9 and ☐
8. 48 → 6 and ☐

9. 28 → 4 and ☐
10. 72 → 12 and ☐
11. 100 → 2 and ☐
12. 5 → 5 and ☐

Find all the factors of the following numbers. The number of factors is shown in brackets.

13. 8 (4)
14. 25 (3)
15. 22 (4)
16. 18 (6)

17. 15 (4)
18. 32 (6)
19. 60 (12)
20. 36 (9)

If you wish to move on to an extension task – have a go at Section B.

Remember, to find factors of larger numbers, we have to use division to see whether that number is a factor.

For example,

To find the factors of 98:

- **Step One**: 1 and 98 is the first factor pair.
- **Step Two**: I know 2 will be a factor because the number is even. But I need to be able to work out what do I multiply 2 by to get to 98?
- I would find this other factor by using division. 98 ÷ 2 =

  Using bus stop division, you can work out that 2 x 49 = 98

  So 2 and 49 are factors of 98.

B

Find all the factors of:

1. 98
2. 52
3. 66
4. 63
5. 48
6. 84
7. 102
8. 78
9. 90
10. 132
11. 140
12. 108
13. 127
14. 117
15. 124
16. 112.

(Please note: The times table grid does not show all of the multiplication facts – each line of multiples keeps going – 98 would be in the two times table if you carried on writing the multiples of 2 up to 100.)

- **Step Three**: 98 is not on the times table grid in the 3 x table, but I would still need to check whether 3 is factor, then 4, then 5 etc. If there is no remainder when I divide 98 by a number, I have found another factor!

To carry on with finding factors of 98, we need to be very methodical, working through possibilities in a clear order. We've found 1 is a factor and 2, now let's look at 3…

- 3 is **not** a factor (when we divide 98 by 3 – there is a remainder)
- 4 is **not** a factor (when we divide 98 by 4 – there is a remainder)
- 5 is **not** a factor (we know multiples of 5 end in a 5 or a 0)
- 6 is **not** a factor (when we divide 98 by 6 – there is a remainder)
- 7 is a factor (when we divide 98 by 7 – we find the answer is 14. So we can say 7 x 14 are both factors of 98)

- 8 is **not** a factor (we know 8 x 12 = 96, so 98 is not in the 8 x table)
- 9 is **not** a factor (we know 9 x 11 = 99, so 98 is not in the 9 x table)
- 10 is **not** a factor (we know multiples of 10 end in a 0)
- 11 is **not** a factor (we know 11 x 9 = 99, so 98 is not in the 11 x table)
- 12 is **not** a factor (we know 12 x 8 = 96, so 98 is not in the 12 x table)
- 13 is **not** a factor (if we write down the 13 x table, we get 7 x 13 = 91, so 98 won't be in the 13 x table)
- 14 is a factor (we know this from above: 14 x 7 = 98)

- When we repeat a factor already in our list (14 is already in our list of factors) we can stop – there will be no more factors.
- So we have discovered the factors of 98 are:

  1, 98, 2, 49, 7 and 14.

(The order of these factors don't matter, just that we write them in a list and we don't miss any out. Always work out the **factor pairs**.)

Now have a go at as many of the 16 questions as you can – the more questions you cover, the more you will become factortastic!

1. 8
2. 5
3. 4
4. 9
5. 8
6. 3
7. 10
8. 8
9. 7
10.   6
11.   50
12.   1
13.   Factors of 8 = 1, 8, 2 and 4
14.   Factors of 25 = 1, 25 and 5
15.   Factors of 22 = 1, 22, 2 and 11
16.   Factors of 18 = 1, 18, 2, 9, 3 and 6
17.   Factors of 15 = 1, 15, 3 and 5
18.   Factors of 32 = 1, 32, 2, 16, 4 and 8
19.   Factors of 60 = 1, 60, 2, 30, 3, 20, 4, 15, 5, 12, 6 and 10
20.   Factors of 36 = 1, 36, 2, 18, 3, 12, 4, 9, 6

<u>Answers - Section B:</u>

1. Factors of: 98 = 1, 2, 7, 14, 49, 98
2. 52 = 1, 2, 4, 13, 26, 52
3. 66 = 1, 2, 3, 6, 11, 22, 33, 66
4. 63 = 1, 3, 7, 9, 21, 63
5. 48 = 1, 2, 3, 4, 6, 8, 12, 16, 24, 48
6. 84 = 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84
7. 102 = 1, 2, 3, 6, 17, 34, 51, 102
8. 78 = 1, 2, 3, 6, 13, 26, 39, 78
9. 90 = 1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90
10. 132 = 1, 2, 3, 4, 6, 11, 12, 22, 33, 44, 66, 132
11. 140 = 1, 2, 4, 5, 7, 10, 14, 20, 28, 35, 70, 140
12. 108 = 1, 2, 3, 4, 6, 9, 12, 18, 27, 36, 54, 108
13. 127 = 1 and 127 (127 is a prime number)*
14. 117 = 1, 3, 9, 13, 39, 117
15. 124 = 1, 2, 4, 31, 62, 124
16. 112 = 1, 2, 4, 7, 8, 14, 16, 28, 56, 112

*We will be looking at prime numbers tomorrow. Prime numbers only have two factors – itself and 1.