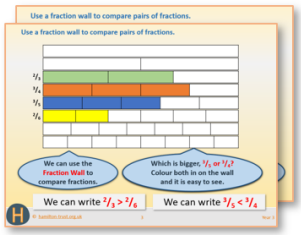
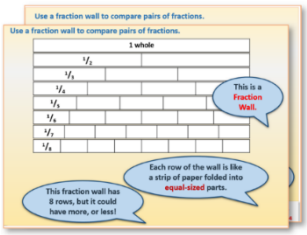
Year 4: Week 3, Day 5
Factors

Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. If possible, watch the **PowerPoint presentation** with a teacher or another grown-up.
   Print a copy of the Fraction Wall resource sheet to use while you watch (see next page).



   OR start by carefully reading through the **Learning Reminders**.
   They come from our *PowerPoint* slides.



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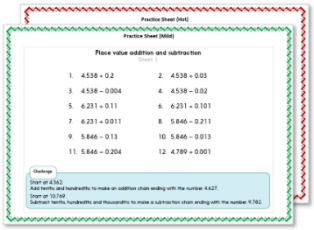
2. Tackle the questions on the **Practice Sheet**.
   There might be a choice of either Mild (easier) or Hot (harder)!
   Check the answers.



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3. Finding it tricky? That's OK… have a go with a grown-up at **A Bit Stuck?**

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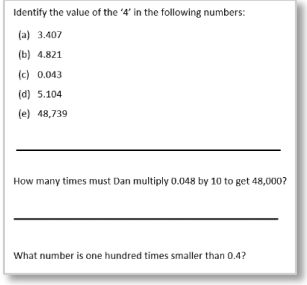
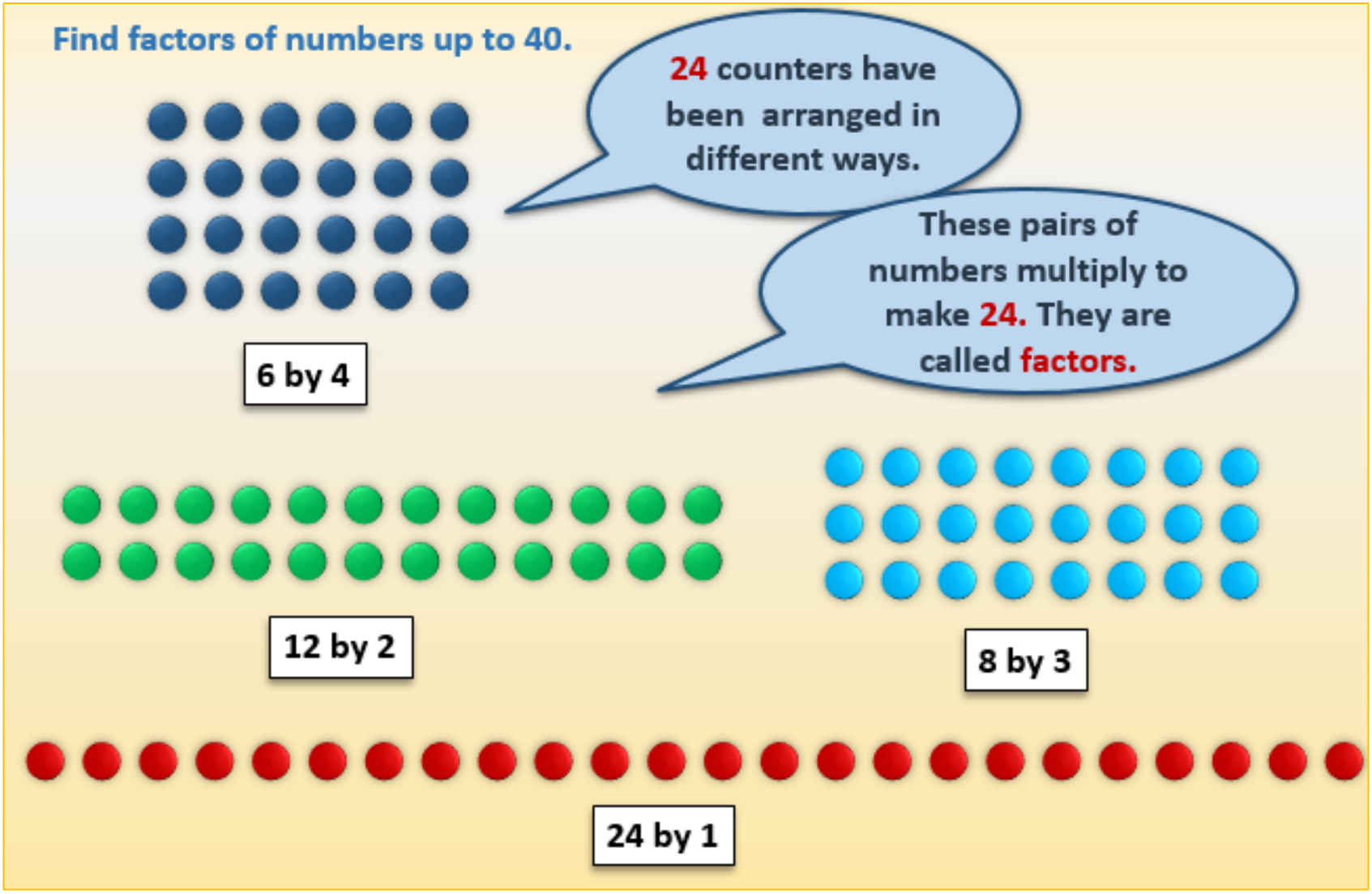
4. Have I mastered the topic? Answer a few questions to **Check your understanding**.
   Fold the page to hide the answers!



Learning Reminders



Learning Reminders

Find factors of numbers up to 40.

24 is a **multiple** of 1, 2, 3, 4, 6, 8, 12 and 24. These numbers are called its **factors.**

Factors are numbers that will 'go into' 24 without any left over. They come in pairs, e.g. 6 and 4.

There are **4 factor pairs for 24**. 6 and 4, 8 and 3, 12 and 2 and 24 and 1.

Learning Reminders

Explore the factors of numbers to 144.

Write some multiplication facts for 18.

18 is on the grid in 4 places.

18 is in the 2, 3, 6 and 9 times tables. 1 × 18 also makes 18, so 18 has three pairs of factors...

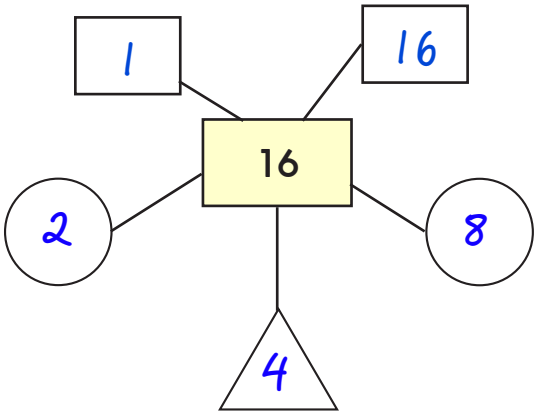
... 3 and 6, 2 and 9 and 1 and 18.

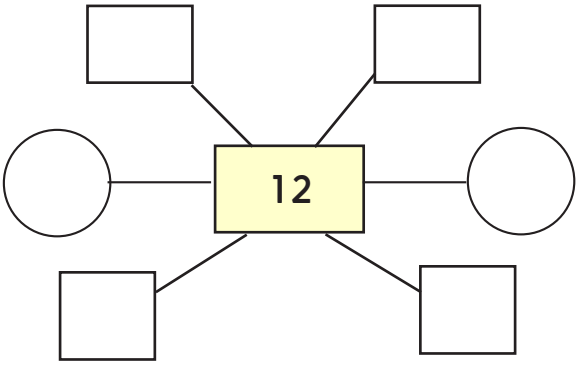
x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	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

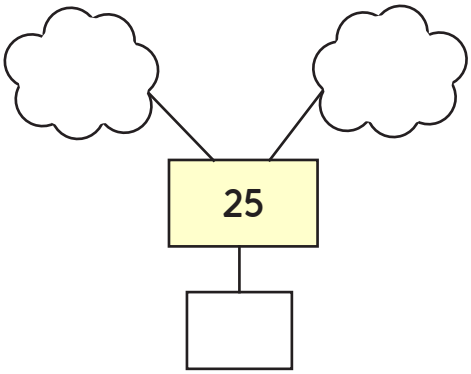
Practice Sheets Mild

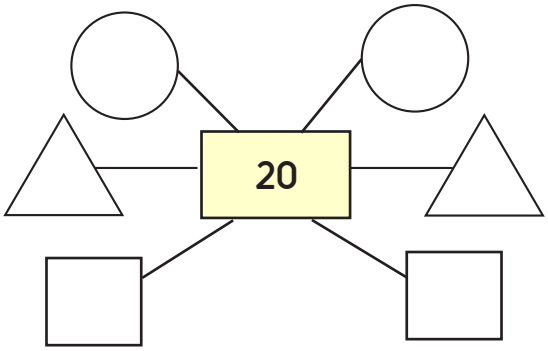
Factors practice

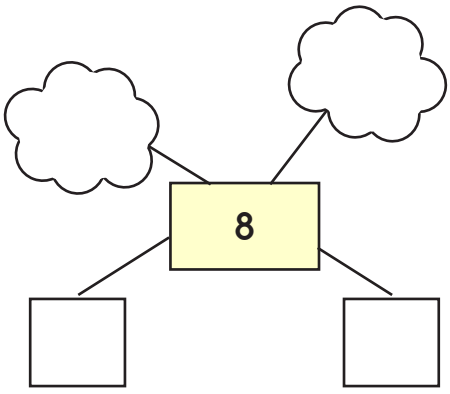
Write the factors of each number.
The first one is done for you.

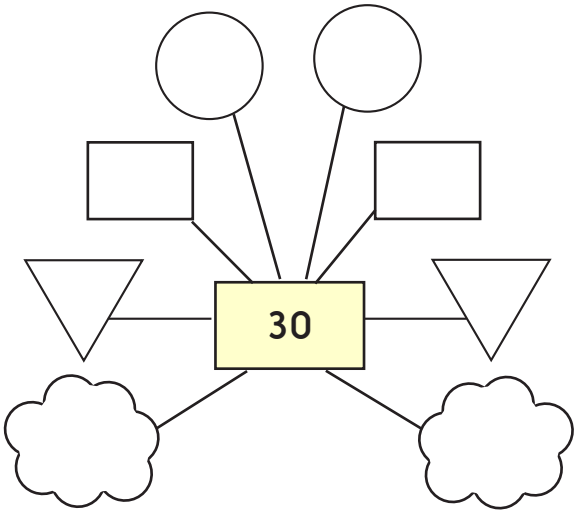












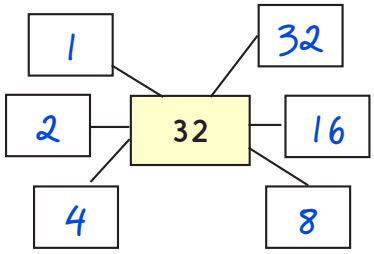
Challenge

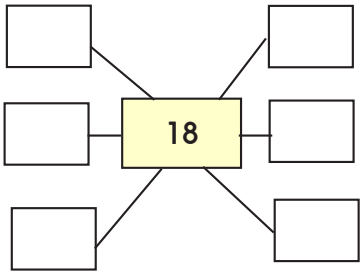
Draw your own diagram for the factors of 24 and 29. Predict which will have more factors?

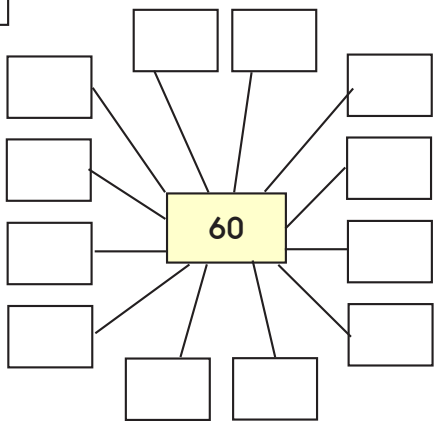
Practice Sheets Hot

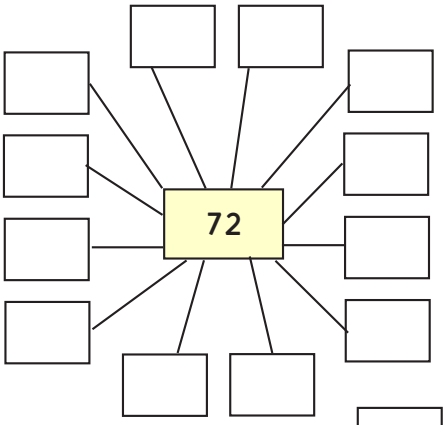
Factors practice

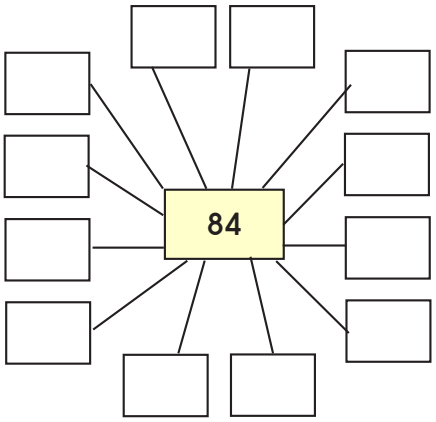
Write the factors of each number.
Work through them systematically.
The first one is done for you.

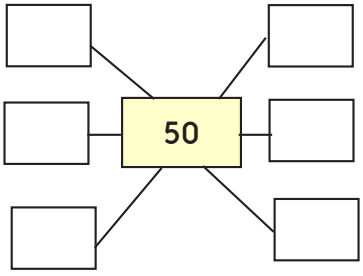












Challenge

Draw your own boxes for the factors of 35 and 42.

Practice Sheet Answers

Factors practice (Mild)

Factors of 12 are 1, 2, 3, 4, 6, 12
Factors of 20 are 1, 2, 4, 5, 10, 20
Factors of 8 are 1, 2, 4, 8
Factors of 25 are 1, 5, 25
Factors of 30 are 1, 2, 3, 5, 6, 10, 15, 30

Challenge

Factors of 24 are 1 and 24, 2 and 12, 3 and 8, 4 and 6.

Factors practice (Hot)

Factors of 60 are 1, 2, 3, 4, 5, 6,10,12,15, 20, 30, 60
Factors of 18 are 1, 2, 3, 6, 9, 18
Factors of 72 are 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72
Factors of 84 are 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84
Factors of 50 are 1, 2, 5, 10, 25, 50

Challenge

Factors of 35 are 1 and 35, 5 and 7.
Factors of 42 are 1 and 42, 2 and 21, 3 and 14, 6 and 7.

A Bit Stuck?
Array or disarray?

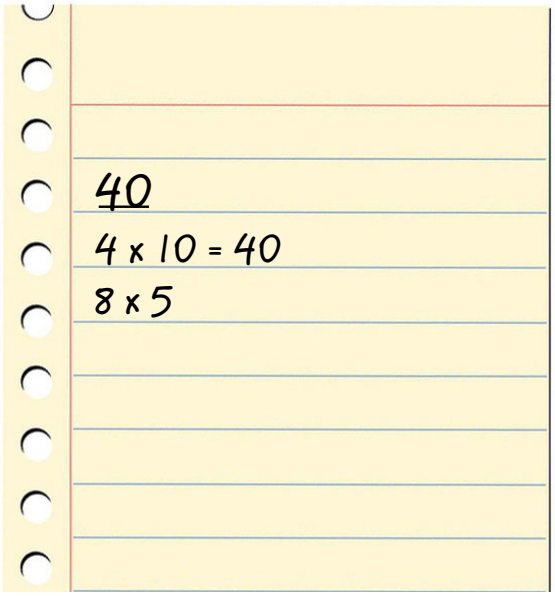
Work in pairs

Things you will need:
- 50 counters
- A pencil

What to do:

12, 15, 18, 20, 25, 28, 30

- Choose a number.
  Take this number of counters.
  Arrange the counters into an array (rectangle).
  Write the matching multiplication.
- Now rearrange them into as many different arrays as you can.
  Write the matching multiplication each time.
- Score one point for each multiplication you write.
- Choose another number and do the same.
  Try to score as many points as you can.
- Carry on choosing different numbers and making as many arrays as you can.
  Write the matching multiplication each time.
- Which numbers do you think will score lots of points?
  Which number do you think won't score many points?



S-t-r-e-t-c-h:

Find the number between 40 and 50 with the greatest number of factors, i.e. the greatest number of possible arrays.

Learning outcomes:
- I can make different arrays for a given number and write the matching multiplications.
- I understand that multiplication works both ways, e.g. 4 x 6 = 6 x 4.
- I am beginning to identify pairs of factors.

Check your understanding:
Questions

Selma says 'The bigger a number, the more pairs of factors it has'. Do you agree with her? Explain your ideas.

Always true, sometimes true or never true?

- A number with only two factors is odd.
- A number with 4 factors is even.
- A number less than 100 with 6 factors is even.
- A number with 6 as one of its factors, also has 3 as a factor.
- An odd number can have 2 as a factor.

Fold here to hide answers:

Check your understanding:
Answers

Selma says 'The bigger a number, the more pairs of factors it has'. Do you agree with her? Explain your ideas.

This does not automatically follow – in particular large prime numbers, e.g. 71 and 83 have only the number itself and 1 as factors, whereas 8 has 4 factors – 1, 2, 4 and 8. Ensure children give examples to back up their arguments.

Always true, sometimes true or never true?

- A number with only two factors is odd. Sometimes, e.g. the vast majority of prime numbers, with the exception of 2, which has two factors and is even.
- A number with 4 factors is even. Sometimes but an exception is 15 which has 4 factors – 1, 3, 5 and 15. 21 and 27 also have 4 factors.
- A number less than 100 with 6 factors is even. Sometimes but as with the previous statement there are exceptions. 45 has 6 factors – 1, 3, 5, 9, 15 and 45. 63 and 75 also have 6 factors.
- A number with 6 as one of its factors, also has 3 as a factor. This is always true since any multiple of 6 is also a multiple of 3.
- An odd number can have 2 as a factor. Never true, since 2 multiplied by any number always results in an even number.