Maths workshop

16.1.24

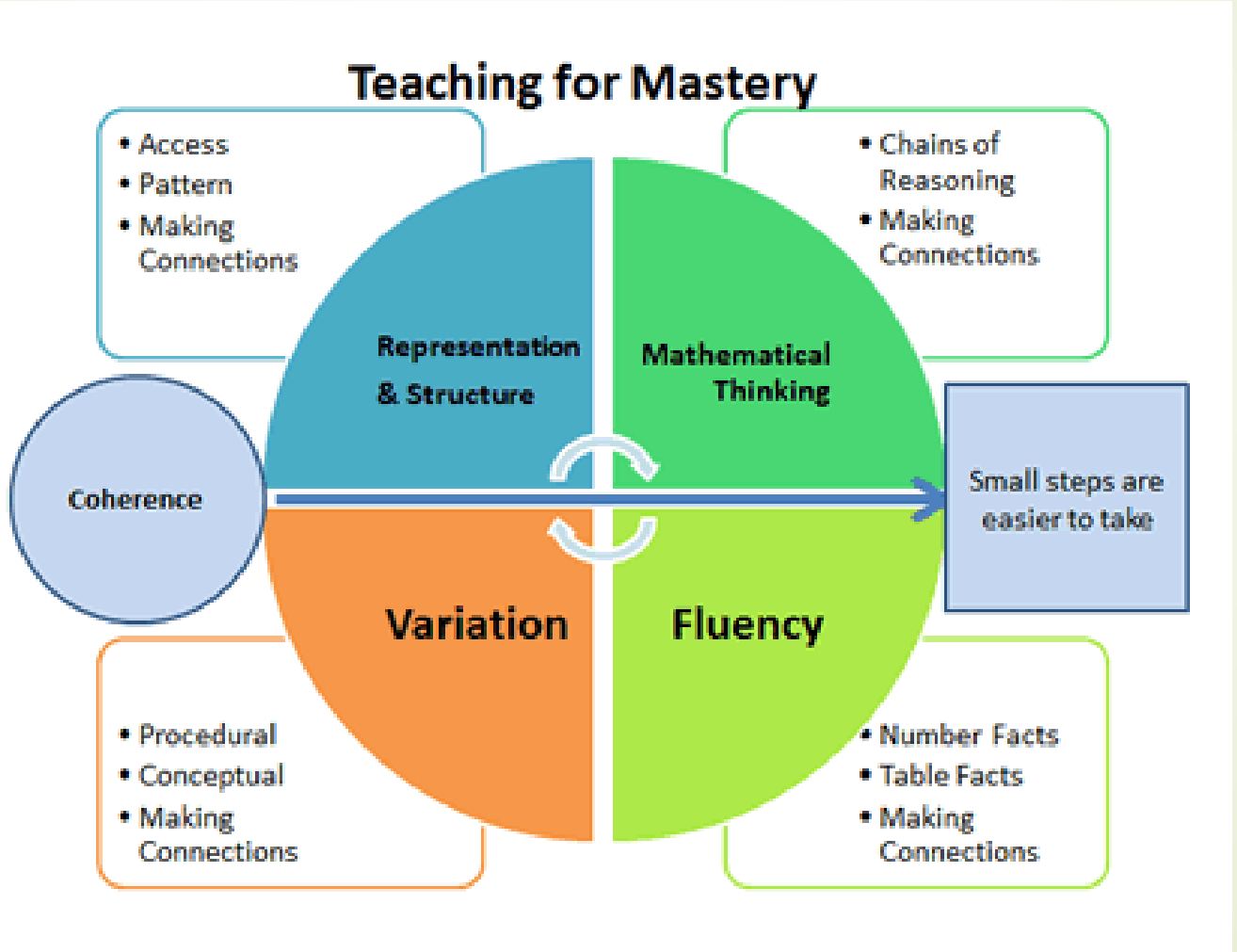
Has maths changed?

- https://whiteroseeducation.com/parent-pupil-resources/maths/maths-with-michael#watch

What is maths mastery?

- Mastering maths means pupils acquiring a deep, long-term, secure and adaptable understanding of the subject.
- The phrase ‘teaching for mastery’ describes the elements of classroom practice and school organisation that combine to give pupils the best chances of mastering maths.
- Achieving mastery means acquiring a solid enough understanding of the maths that’s been taught to enable pupils to move on to more advanced material.

Five big ideas in teaching mastery



Ways not to overload working memory in maths

- Subitise – recognise number patterns/groups and **not** only use counting
- Know whole numbers
- Learn number bonds constantly even when you know them so that they are instantly remembered/pictured/represented in your long term memory for recall
- Learn times tables over and over for instant recall and understanding.
- Know equal parts of a whole number are fractions. Use the phrase ‘part of a whole’ in different ways e.g. a lego brick is part of the whole model
- Partition numbers using tens, hundreds, thousands, hundred thousands. Know place value.

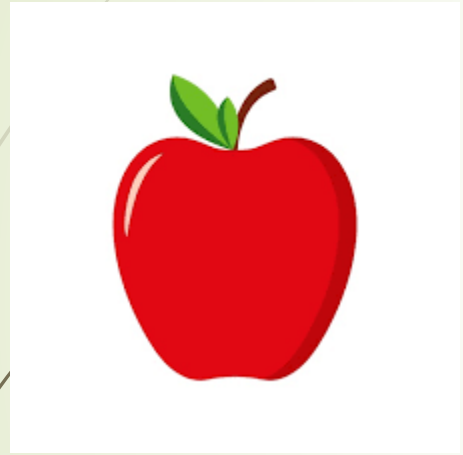
Vocabulary and using whole sentences

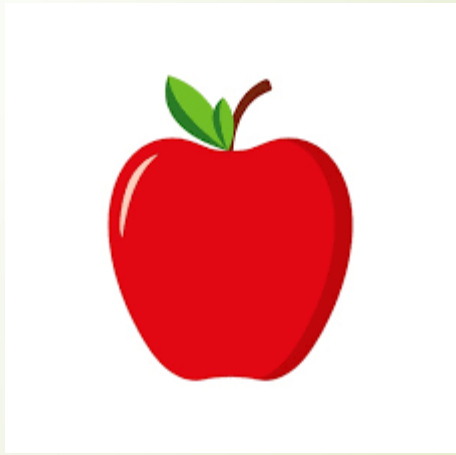
- Practice explaining, saying and using maths vocabulary. For each year group and unit vocabulary on website.

Representations/equipment

- Subitise
- Tens frame
- Number lines
- 100 square
- Part whole model
- Bar models
- Base 10/dienes, ones, hundreds
- Place value counters

Subtise

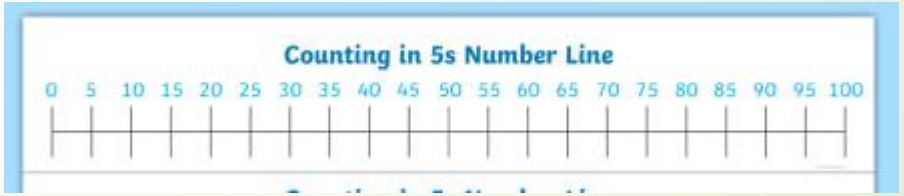




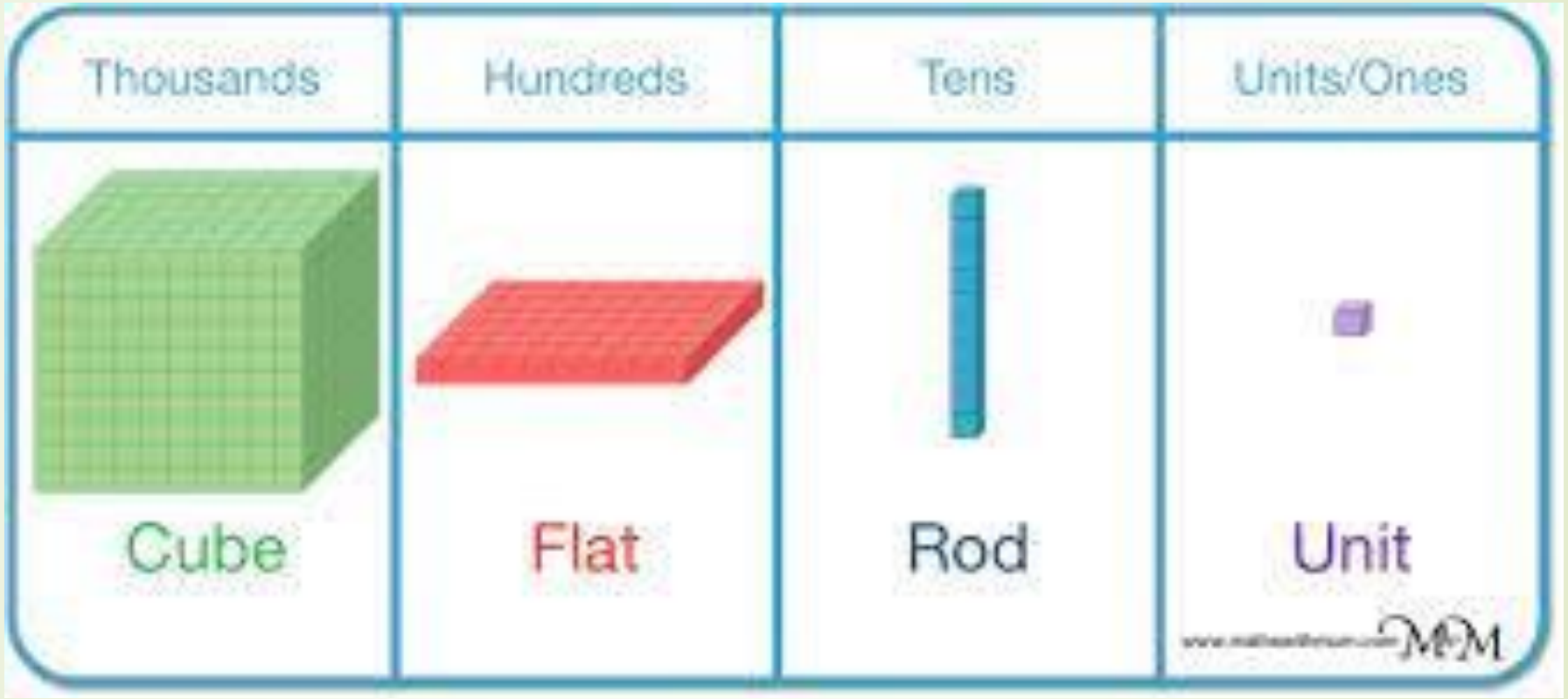
Hundred square

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

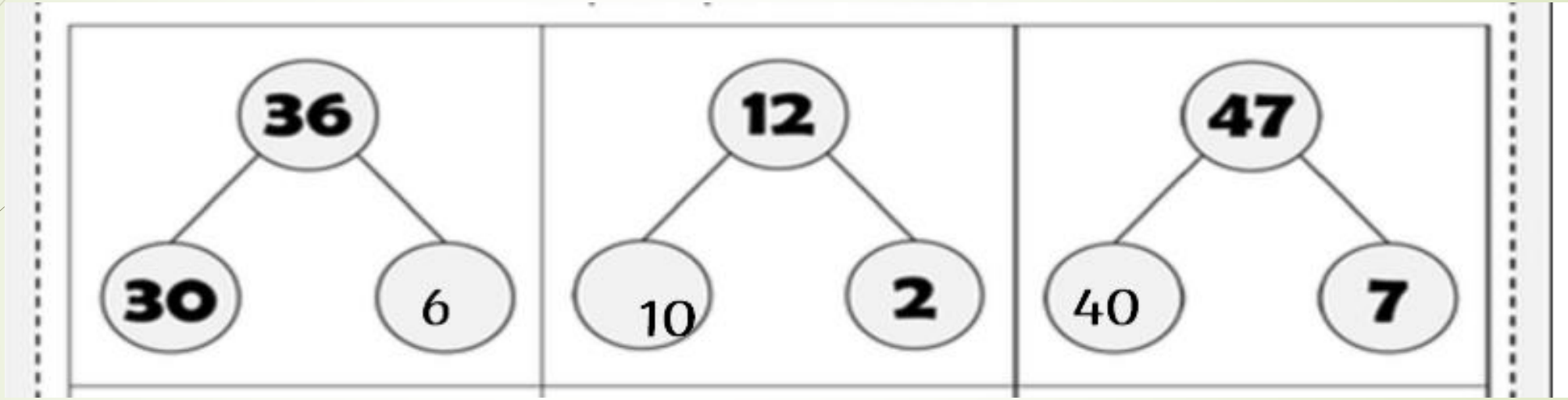
Number lines



Base 10

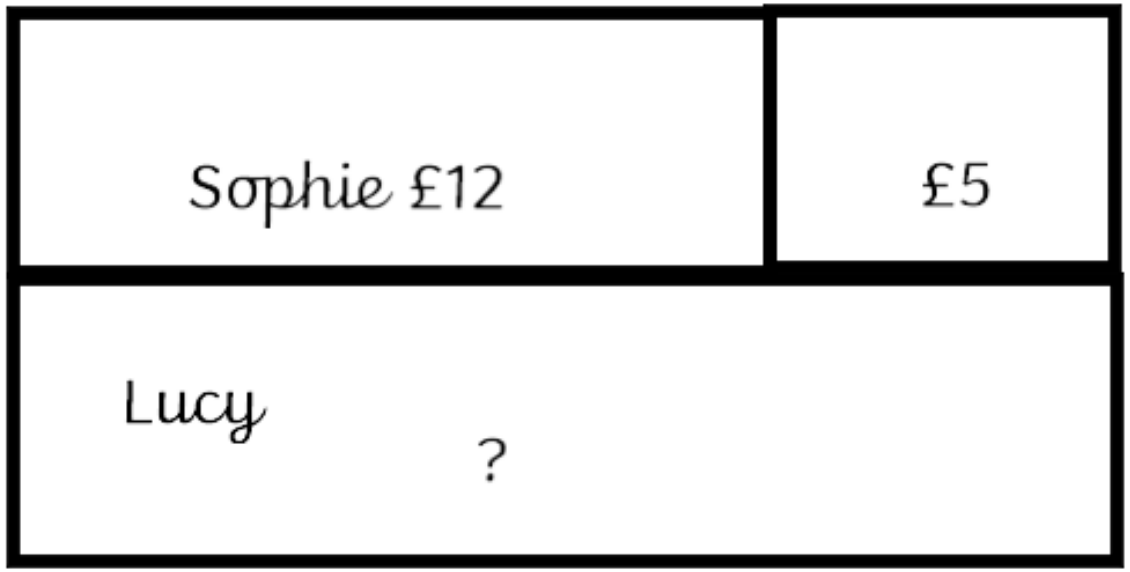


Part Whole Models



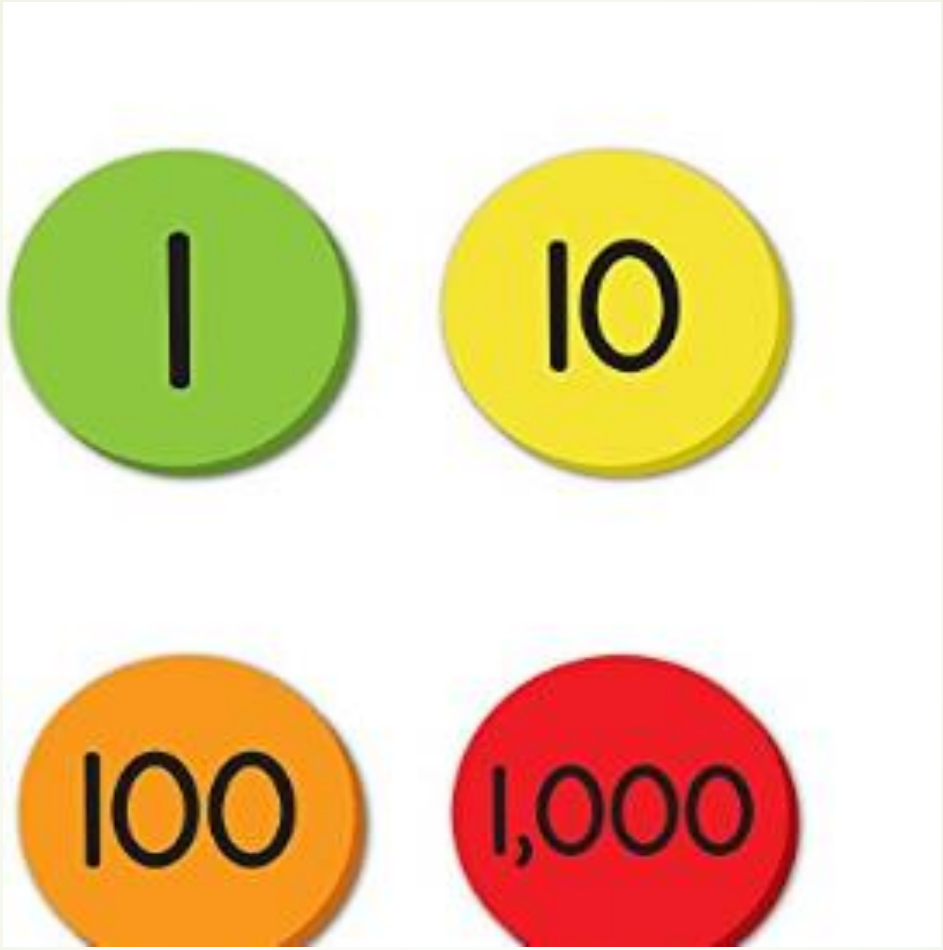
Bar Models

- Sophie has £12, Lucy has £5 more than Sophie. How much money does Lucy have?



Place Value Chart – Thousands

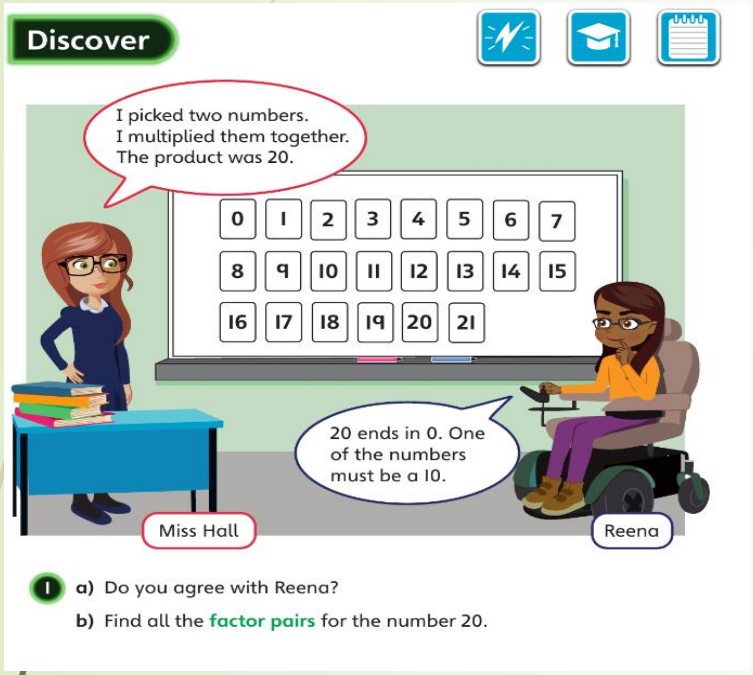
Thousands	Hundreds	Tens	Units/Ones
4	2	6	8

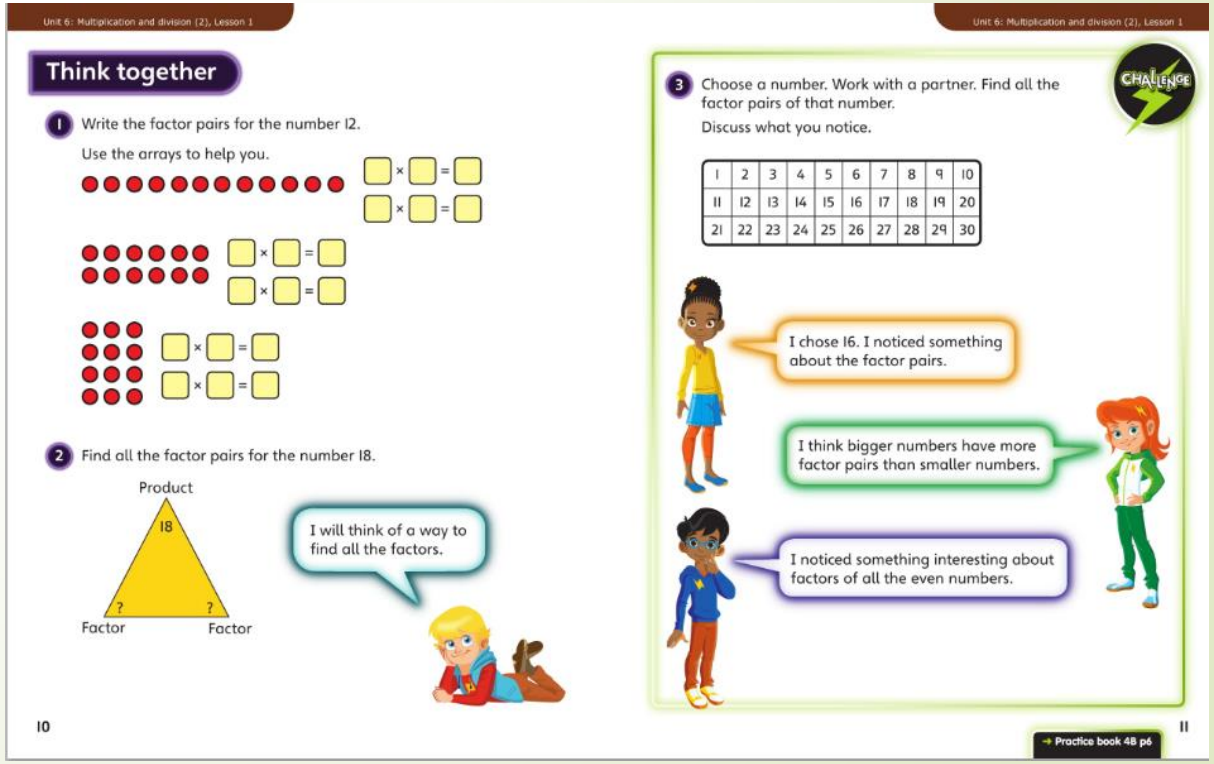

1
10
100
1,000

Our Year 4 maths curriculum

- **Term 1**
- Unit 1 Place value (4 digit numbers)
- Unit 2 Place value (4 digit numbers)
- Unit 3 Addition and Subtraction
- Unit 4 Measure (area)
- Unit 5 Multiplication and Division
- **Term 2**
- Unit 6 Multiplication and Division
- Unit 7 Length and perimeter
- Unit 8 Fractions (1)
- Unit 9 Fractions (2)
- Unit 10 Decimals (1)
- **Term 3**
- Unit 11 Decimals (2)
- Unit 12 Money
- Unit 13 Time
- Unit 14 Geometry (Angles and 2d shapes)
- Unit 15 Statistics
- Unit 16 Geometry (Position and direction)

A mastery lesson using Powermaths
Year 4 Unit 6
LC How do mathematicians find factor pairs?





L.C. How do mathematicians find factor pairs?

Success Criteria			Vocabulary
☐ I can build arrays to show multiplication facts. ☐ I can explore different arrays for a given number. ☐ I can use my knowledge of times tables to find factor pairs.	The Learning Pit Mark where you are at the beginning of the lesson with a • and at the end of the lesson with an x. 		factor factor pair product multiply multiple
On my own	With others	With adult help	

Power Up

Use the clues to complete the puzzle.

Across

1. 25 × 5

3. 11 × 11

4. 9 × 7

6. 6 × 70

7. 6 × 10

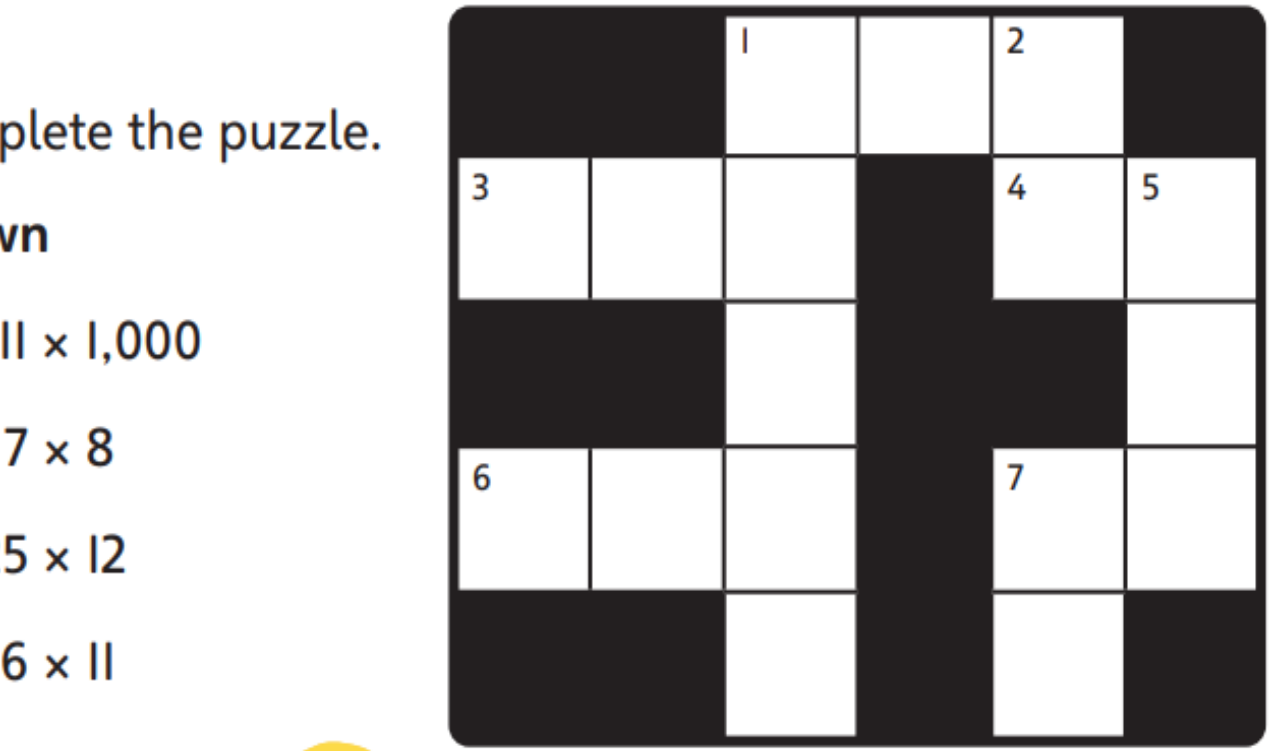
Down

1. 11 × 1,000

2. 7 × 8

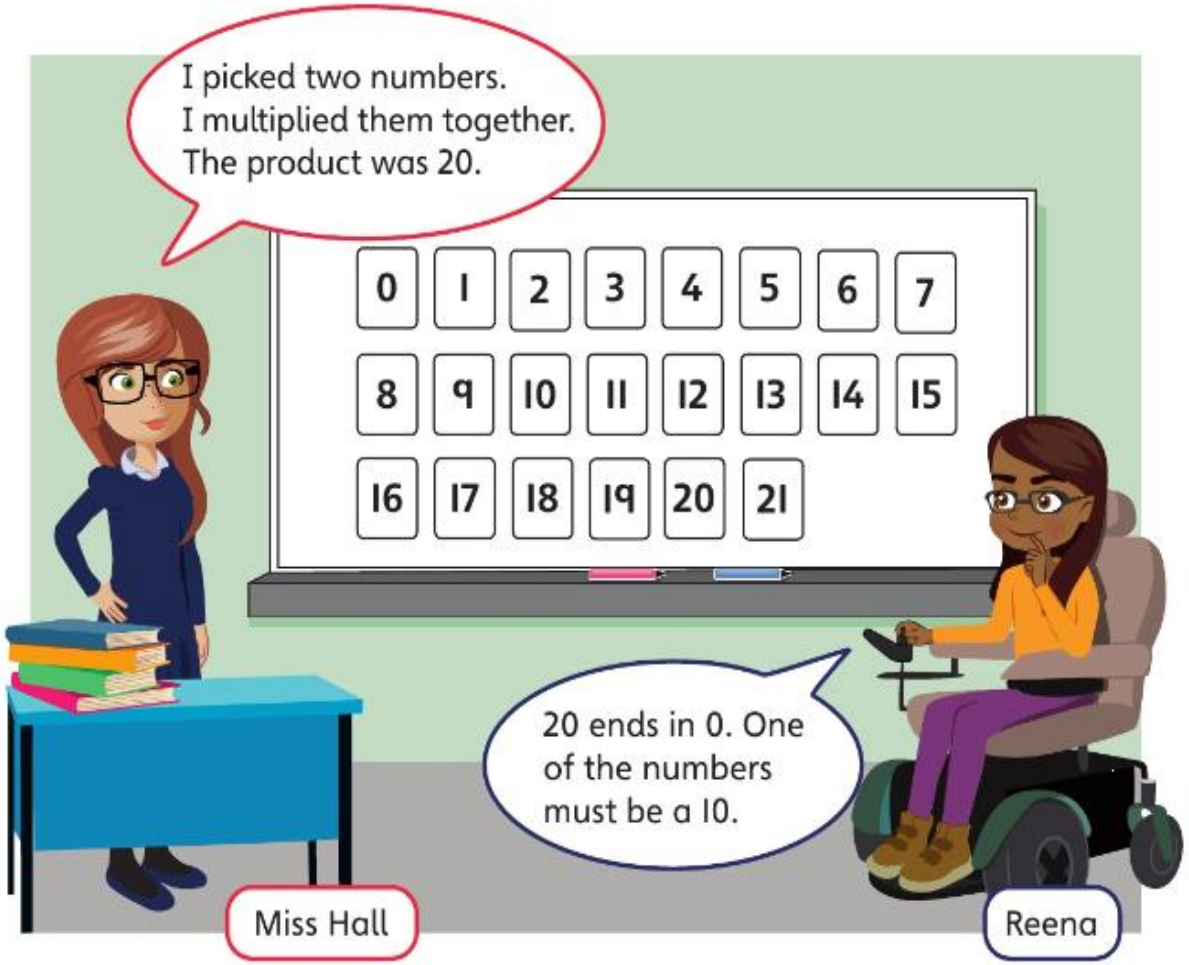
5. 25 × 12

7. 6 × 11



I will use my times-tables to help answer these problems.

Discover



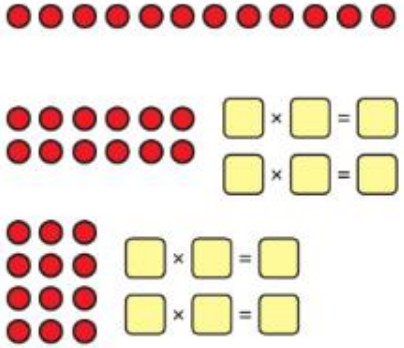
1 **a)** Do you agree with Reena?

b) Find all the **factor pairs** for the number 20.

Think together

1 Write the factor pairs for the number 12.

Use the arrays to help you.



2 Find all the factor pairs for the number 18.

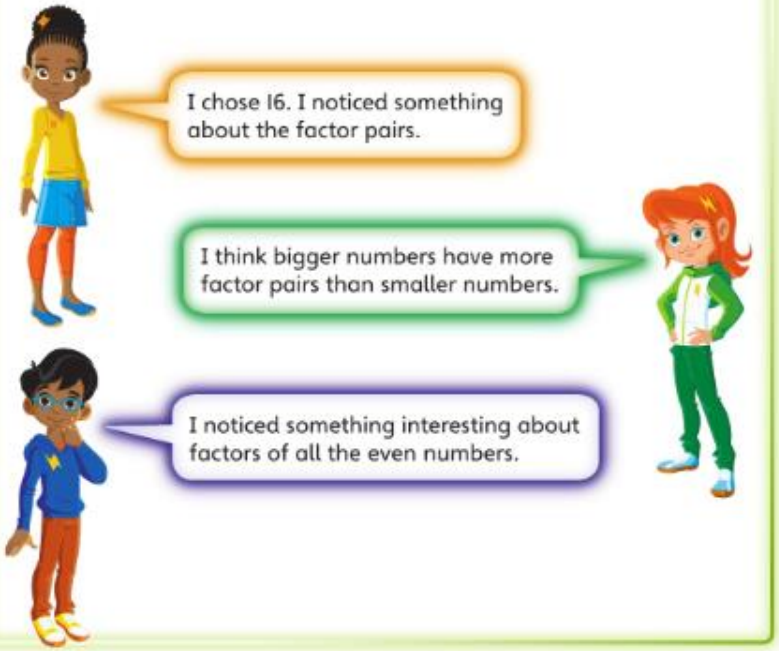
Unit 6: Multiplication and division (2), Lesson 1

CHALLENGE

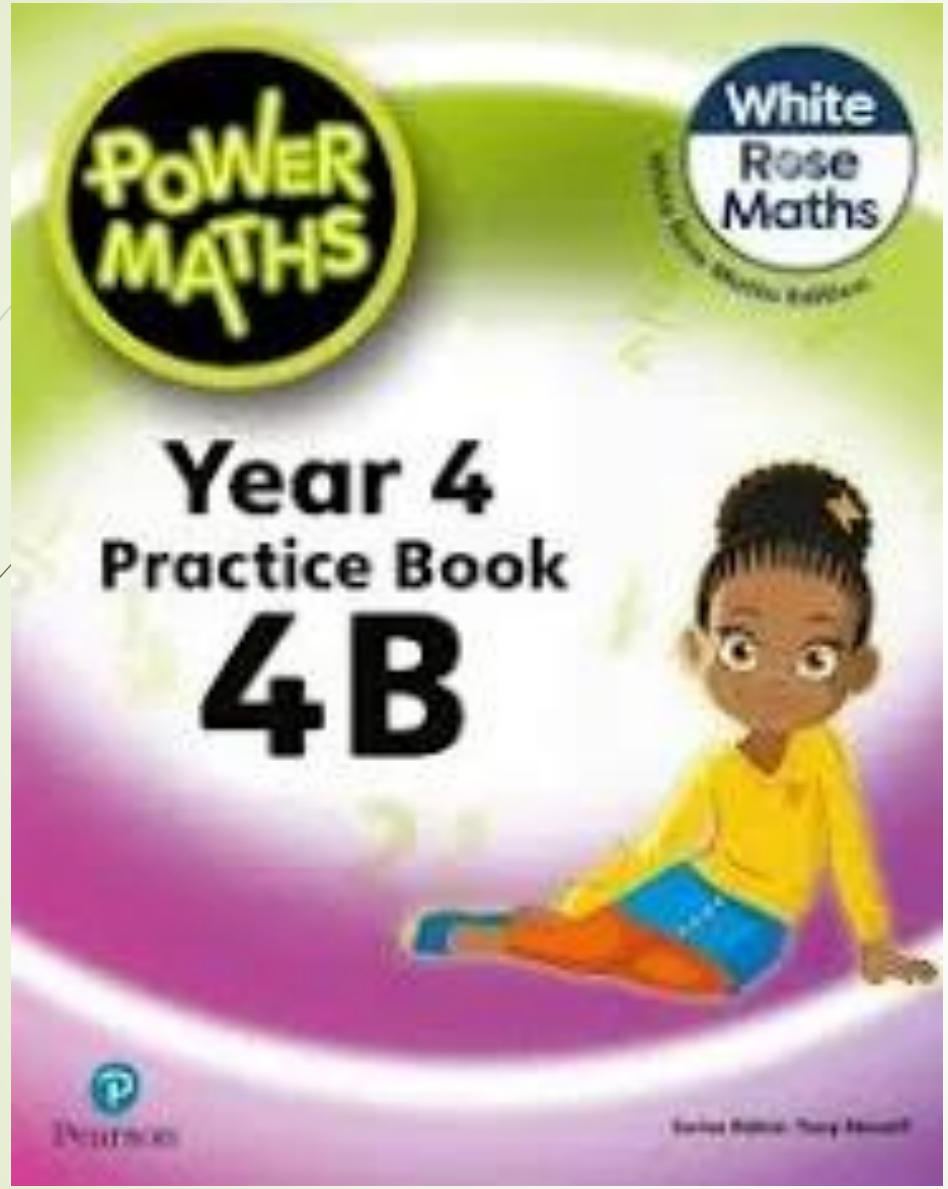
3 Choose a number. Work with a partner. Find all the factor pairs of that number.

Discuss what you notice.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30



→ Practice book 4B p6


POWER MATHS
White Rose Maths
Year 4
Practice Book
4B
Pearson

Date: 4/24 absent

→ Textbook 4B p8

Factor pairs

1 Write the factor pairs for the number 10.

a) ● ● ● ● ● ● ● ● ● ●

b) ● ● ● ● ●
● ● ● ● ●

× = 10
× = 10
× = 10
× = 10

2 Write the factor pairs for the number 14.

a)

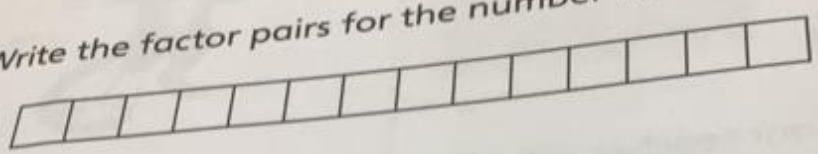
× =
×

4 Find

b)

2 Write the factor pairs for the number 14.

a)



□ × □ = 14

□ × □ = 14

b)

□ × □ = 14

□ × □ = 14

3 Write the factor pairs for the number 15.

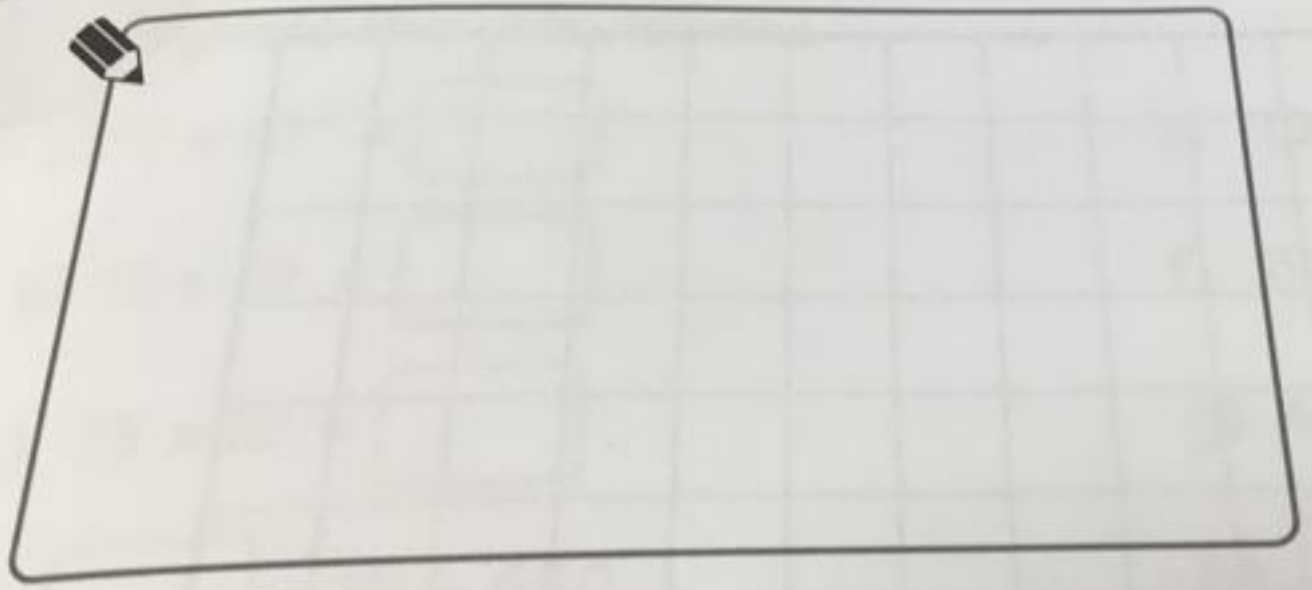
□ × □ = 15

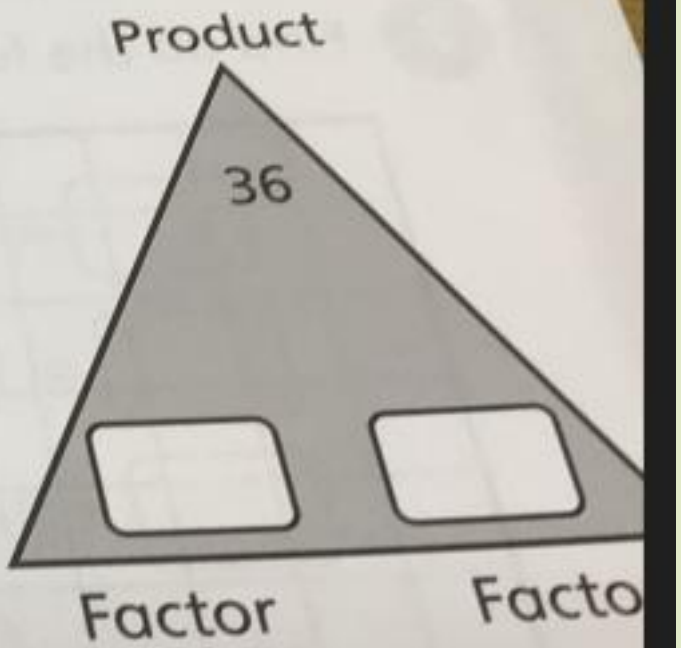
□ × □ = 15

□ × □ = 15

□ × □ = 15

4 *Find all the factor pairs for the number 36.*





= 10

= 10

= 10

= 10

4

4 Find all the factor pairs for the number 36.

Product

36

Factor Factor

5 Do you agree with Olivia? Explain your answer.

This shows 4 is a factor of 22, because there are 4 rows.

Olivia

□ = 14

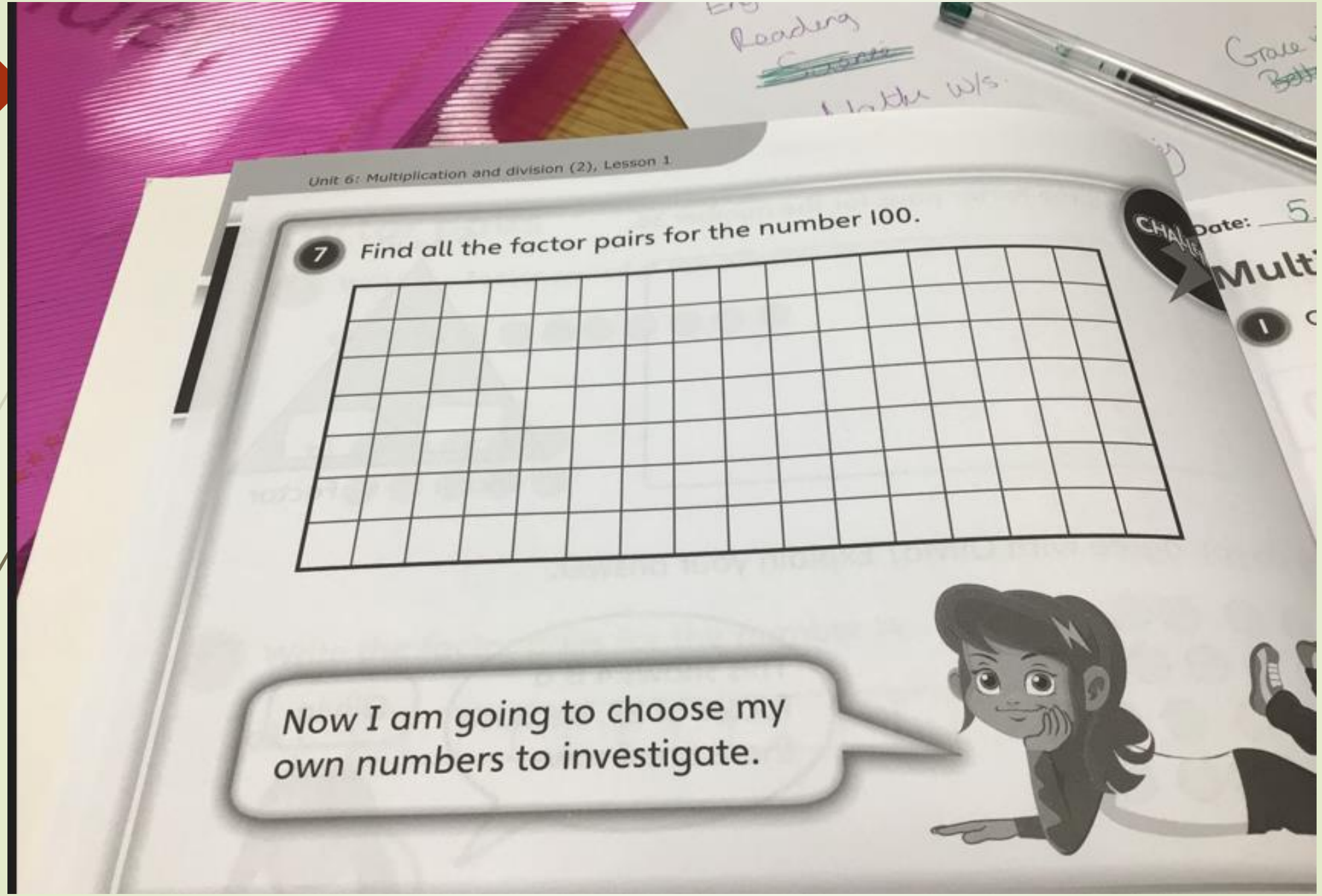
= 14

6 Write down all the factor pairs of

a) 24

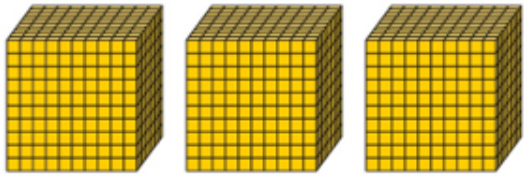
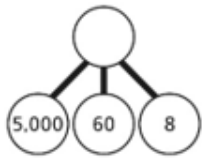
b) 18

c) 25


Unit 6: Multiplication and division (2), Lesson 1
7 Find all the factor pairs for the number 100.
Now I am going to choose my own numbers to investigate.

Calculation policies

Please see the Year 4 class page for details

Year 4			
	Concrete	**Pictorial**	**Abstract**
Year 4 Addition			
Understanding numbers to 10,000	Use place value equipment to understand the place value of 4-digit numbers.  *4 thousands equal 4,000.* *1 thousand is 10 hundreds.*	Represent numbers using place value counters once children understand the relationship between 1,000s and 100s.  *2,000 + 500 + 40 + 2 = 2,542*	Understand partitioning of 4-digit numbers, including numbers with digits of 0.  *5,000 + 60 + 8 = 5,068* Understand and read 4-digit numbers on a number line. 

The Year 4 Multiplication Tables Check (MTC)

- **What is the Year 4 Multiplication Tables Check?**
- The multiplication tables check (MTC) is statutory for all year 4 pupils registered at state-funded maintained schools, special schools or academies (including free schools) in England.
-
- **When do children sit the test?**
- Children will sit the test during the 2 weeks from Monday 5th June 2024, ending on the 16th June. They will complete the test on an Ipad in small groups or 1.1.

Access arrangements

These can be made for children with specific educational needs to aid their completion of the test. These could include changes of colour or font size, or how the test is navigated.

What does the test involve?

Children complete 25 questions. The questions cover all times tables up to 12x12. For each question, children are given 6 seconds to type in their answer.

Why TT Rockstars?

TT Rockstar data suggests that the more children use Time Tables Rock Stars, the higher their MTC score will be. Children who played more than an average of 13 minutes per school week in year 4, scored 22/25 or more and to get full marks seems to take an average of 10 hours 36 minutes over year 4, which equates to

☆21 minutes☆ per school week from September to May inclusive.

To populate a child's heatmap, they will need to play in **GARAGE MODE.** Garage mode works with an algorithm which looks at your child's progress and personalises their learning focussing on the tables they need to develop. Green areas indicate multiplication facts that that child is confident recalling whilst red indicates less confident areas. Each child should aim to turn their individual heat map green. Once they have done so they will receive a special certificate.

Times tables. The class heat map

Table	10×	2×	5×	3×	4×	8×	6×	7×	9×	11×	12×
10	10 × 10	10 × 2	10 × 5	10 × 3	10 × 4	10 × 8	10 × 6	10 × 7	10 × 9	10 × 11	10 × 12
2	2 × 10	2 × 2	2 × 5	2 × 3	2 × 4	2 × 8	2 × 6	2 × 7	2 × 9	2 × 11	2 × 12
5	5 × 10	5 × 2	5 × 5	5 × 3	5 × 4	5 × 8	5 × 6	5 × 7	5 × 9	5 × 11	5 × 12
3	3 × 10	3 × 2	3 × 5	3 × 3	3 × 4	3 × 8	3 × 6	3 × 7	3 × 9	3 × 11	3 × 12
4	4 × 10	4 × 2	4 × 5	4 × 3	4 × 4	4 × 8	4 × 6	4 × 7	4 × 9	4 × 11	4 × 12
8	8 × 10	8 × 2	8 × 5	8 × 3	8 × 4	8 × 8	8 × 6	8 × 7	8 × 9	8 × 11	8 × 12
6	6 × 10	6 × 2	6 × 5	6 × 3	6 × 4	6 × 8	6 × 6	6 × 7	6 × 9	6 × 11	6 × 12
7	7 × 10	7 × 2	7 × 5	7 × 3	7 × 4	7 × 8	7 × 6	7 × 7	7 × 9	7 × 11	7 × 12
9	9 × 10	9 × 2	9 × 5	9 × 3	9 × 4	9 × 8	9 × 6	9 × 7	9 × 9	9 × 11	9 × 12
11	11 × 10	11 × 2	11 × 5	11 × 3	11 × 4	11 × 8	11 × 6	11 × 7	11 × 9	11 × 11	11 × 12
12	12 × 10	12 × 2	12 × 5	12 × 3	12 × 4	12 × 8	12 × 6	12 × 7	12 × 9	12 × 11	12 × 12

An individual heat map

	10	2	5	3	4	8	6	7	9	11	12
10	10 x 10	10 x 2	10 x 5	10 x 3	10 x 4	10 x 8	10 x 6	10 x 7	10 x 9	10 x 11	10 x 12
2	2 x 10	2 x 2	2 x 5	2 x 3	2 x 4	2 x 8	2 x 6	2 x 7	2 x 9	2 x 11	2 x 12
5	5 x 10	5 x 2	5 x 5	5 x 3	5 x 4	5 x 8	5 x 6	5 x 7	5 x 9	5 x 11	5 x 12
3	3 x 10	3 x 2	3 x 5	3 x 3	3 x 4	3 x 8	3 x 6	3 x 7	3 x 9	3 x 11	3 x 12
4	4 x 10	4 x 2	4 x 5	4 x 3	4 x 4	4 x 8	4 x 6	4 x 7	4 x 9	4 x 11	4 x 12
8	8 x 10	8 x 2	8 x 5	8 x 3	8 x 4	8 x 8	8 x 6	8 x 7	8 x 9	8 x 11	8 x 12
6	6 x 10	6 x 2	6 x 5	6 x 3	6 x 4	6 x 8	6 x 6	6 x 7	6 x 9	6 x 11	6 x 12
7	7 x 10	7 x 2	7 x 5	7 x 3	7 x 4	7 x 8	7 x 6	7 x 7	7 x 9	7 x 11	7 x 12
9	9 x 10	9 x 2	9 x 5	9 x 3	9 x 4	9 x 8	9 x 6	9 x 7	9 x 9	9 x 11	9 x 12
11	11 x 10	11 x 2	11 x 5	11 x 3	11 x 4	11 x 8	11 x 6	11 x 7	11 x 9	11 x 11	11 x 12
12	12 x 10	12 x 2	12 x 5	12 x 3	12 x 4	12 x 8	12 x 6	12 x 7	12 x 9	12 x 11	12 x 12

NO DATA	0 - 1 s	1 - 2 s	2 - 3 s	3 - 4 s	4 - 5 s	5 - 6 s	6 - 7 s	7 - 8 s	8 - 9 s	9 - 10 s	> 10 s

JANUARY & FEBRUARY	SOUNDCHECK (games per week) 3	GARAGE (mins per week) 18	SPRING OUMTC*
MARCH	SOUNDCHECK (games per week) 5	GARAGE (mins per week) 16	
APRIL	SOUNDCHECK (games per week) 3	STUDIO (games per week) 3	GARAGE (mins per week) 15
MAY	SOUNDCHECK (games per week) 6	STUDIO (games per week) 15	SUMMER OUMTC*
JUNE	SOUNDCHECK (games per week) 21		

*The OUMTC is our own mini MTC and it is in semi test conditions. It will give you a good idea of how your students will perform on the real thing. Take part in three OUMTCs throughout the year to give you a baseline, benchmark and time to respond to the results

Maths home learning support

- Supporting and encouraging children with regular routines, setting goals e.g. practise x8 times table……., managing time, working through problems step by step,
- Using maths vocabulary with child and encouraging child to use it in a sentence.