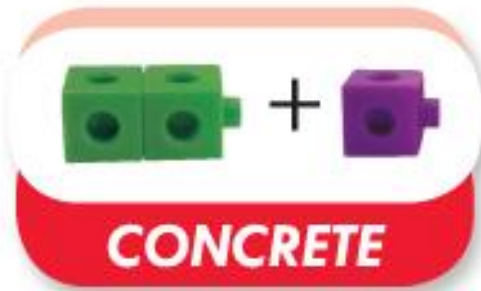


mastering
MATHS

A decorative graphic consisting of seven colored dots of varying sizes arranged in a cluster to the right of the word 'mastering'. The colors include orange, light blue, dark blue, yellow, pink, and teal.

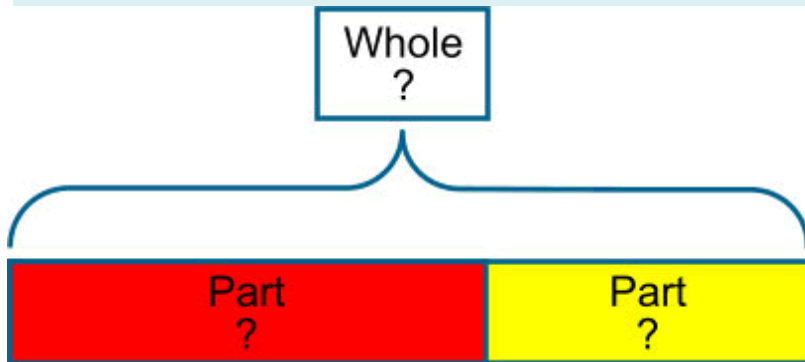
The Approach



Models, images and practical apparatus

All of these play an important part in supporting pupils' conceptual understanding and reasoning skills.

Can you name these?



Flexibility with different representations is an important element of fluency.

Resources/images to help build concepts

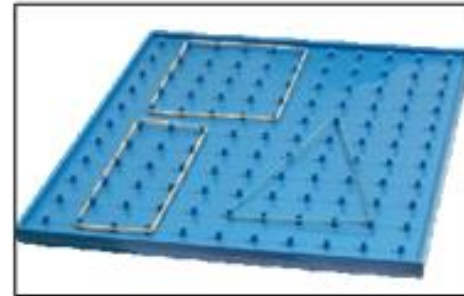
Numicon



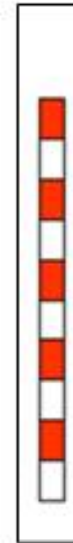
number line



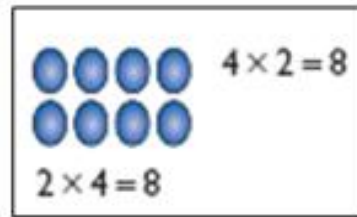
geoboard



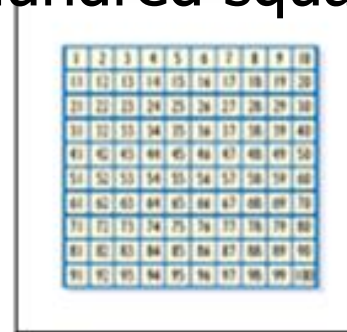
counting stick or metre rule



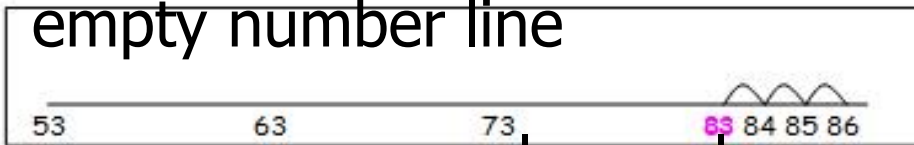
array



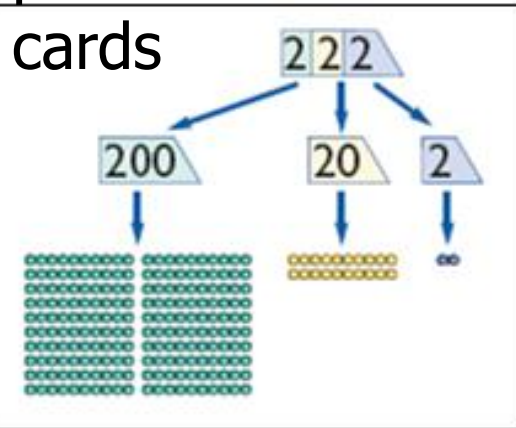
hundred square



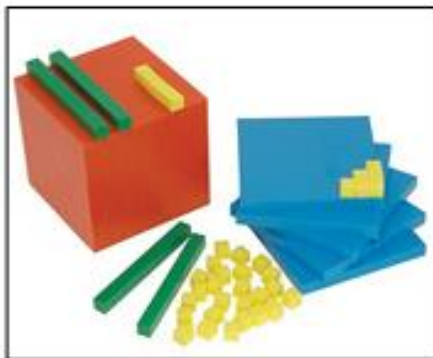
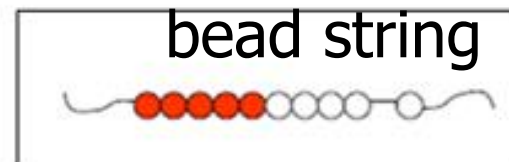
empty number line



place value



bead string



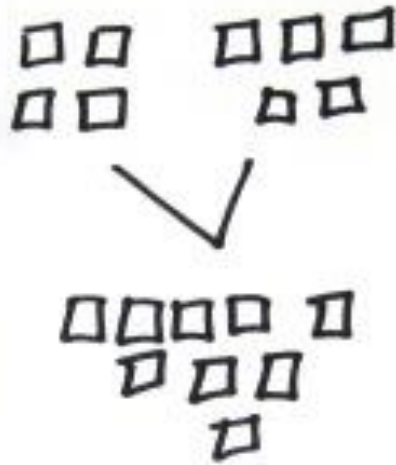
Dienes blocks
base-ten blocks

concrete

Representational

Abstract

①



$$4 + 5 = 9$$

②



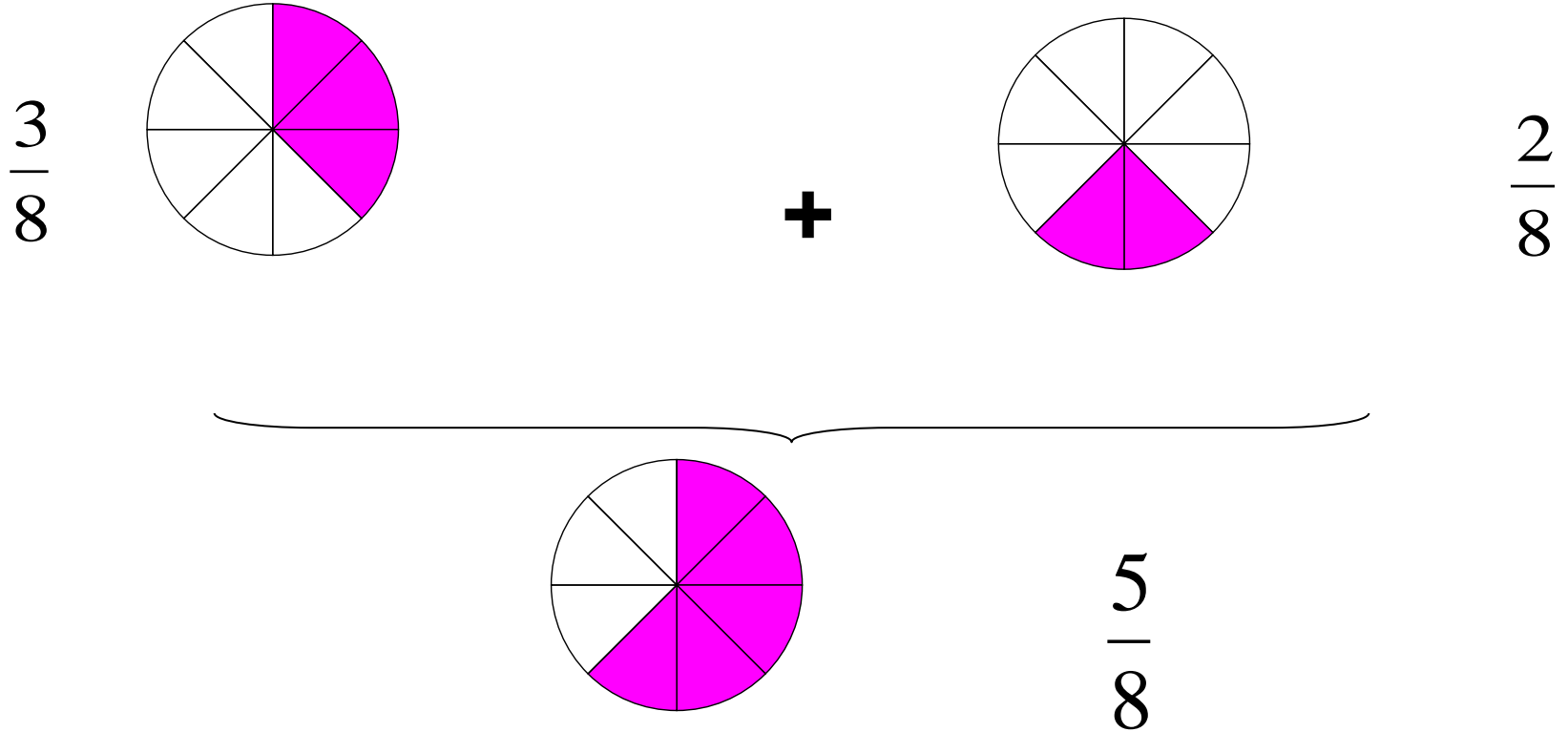
Garfield likes to eat cake. Today, he ate $\frac{2}{8}$ of the cake. Not satisfied he ate $\frac{3}{8}$ of the cake later. How much cake did Garfield eat in total?

$$\frac{3}{8} + \frac{2}{8} =$$



Formulation:

$$\frac{3}{8} + \frac{2}{8} = \frac{2 + 3}{8} = \frac{5}{8}$$



Rules of fraction addition

$$\frac{3}{8} + \frac{2}{8} = \frac{3+2}{8} = \frac{5}{8}$$

Keep the denominator the same
and **add** the numerators.

Chinese teachers do not see repetition and understanding as separate but rather as interlocking processes, complementary to each other (Waktins & Biggs, 2001).

Year 5 Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value			Number: Addition and Subtraction			Number: Multiplication and Division				Statistics	
Spring	Number: Fractions					Number: Decimals			Number: Percentages			
Summer	Geometry: Angles		Geometry: Shapes		Geometry: Position and Direction	Measurement- Converting Units		Number: Prime Numbers	Perimeter and Area	Measures volume		



Mastery in Action

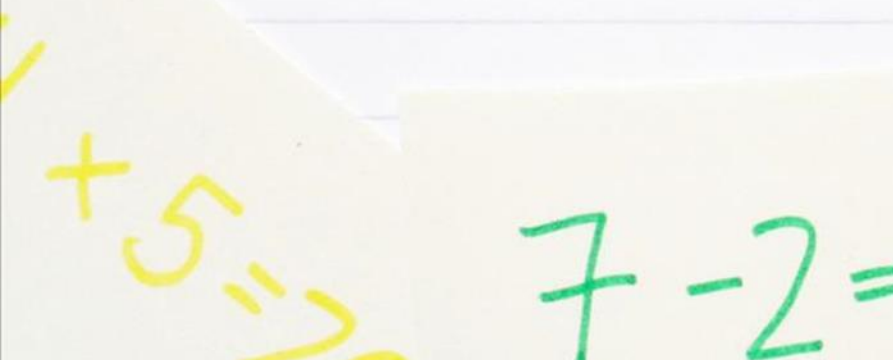


- 5 + 5 = 10 ✓
- 9 + 1 = 10 ✓
- 0 + 10 = 10 ✓
- 6 + 4 = 10 ✓
- 8 + 2 = 10 ✓
- 2 + 8 = 10 ✓
- 1 + 9 = 10 ✓
- 10 + 0 = 10 ✓
- 4 + 6 = 10 ✓



8th and 9th September 2026 LO To recall number bonds to 5 and 10.
* To use concrete apparatus to demonstrate my knowledge of number bonds to 5.
* To demonstrate my knowledge of number bonds to 10.
* To demonstrate my knowledge of number facts to 10.





Number: Place value

28.09.20

LO: To count in steps of 2, 3 and 5 from 0 and to know from any number, forward and backward

Resources: 100 square

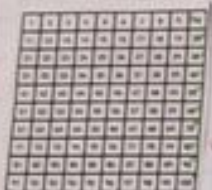
** can count in 2's, 3's and 5's from 0 forwards and backwards

*** can count in 2's, 3's and 5's from 2 forwards and backwards

talk about the pattern and answer word problems.

What went well:

You can count in 2s, 3s, 5s from 0.



Complete the number square below.

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

1.

1	2	3
11		
21		

2.

54	55	56
		66
		76

3.

32	33	34	35
	36	37	38
			40



LO: Counting on in 3s

Complete the following sequences:

- a) 3 6 9 12 15 18 ✓
 b) 24 21 18 15 12 9 ✓
 c) ___ 24 27 30 ___ 36
 d) 45 ___ ___ 36 33 30
 e) 12 ___ 18 21 ___ 27
- f) ___ 48 45 ___ 39 36
 g) 39 42 ___ 48 ___ 54
 h) 21 ___ ___ 12 9 6
 i) ___ ___ 21 24 27 30
 j) 54 51 ___ ___ 42 39



Challenge:

Count in 3's up to 30 and write the numbers down in a column (down the page). Next to it in another column, count in 3's from 33 to 60 and write them down. What do you notice?

to 30
3
6
9
12
15
18
21
24
27
30

from 33
33
36
39
42
45
48
51
54
57

"On the 9th number I got 7, on the 2nd 6. They, um, have the same ones."

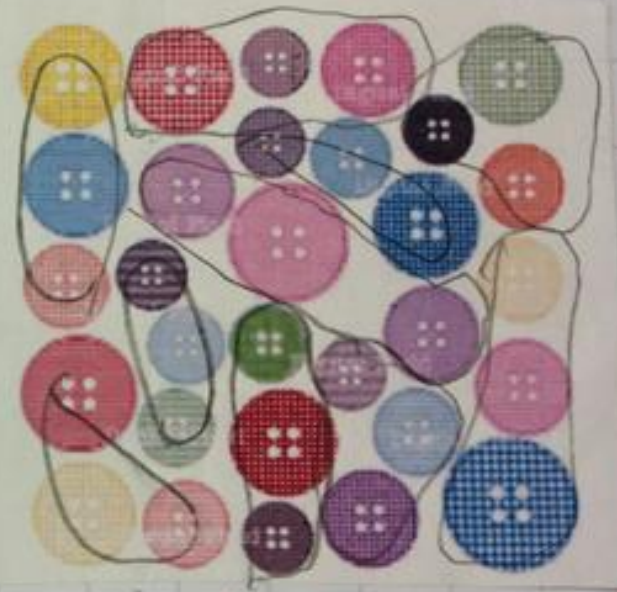
cos 4 + 15 odd.

Challenge

Group these objects to count them.








20 marbles ✓
 $4 \times 5 = 20$ ✓








30 buttons ✓
 $10 \times 3 = 30$ ✓

Number: Place Value
 10.10.16
 10 Use partition 2 digit numbers into different combinations of tens and ones.
 * Use partition 2 digit numbers into different combinations of tens and ones using symbols.












5 tens and 6 ones 4 tens and 6 ones

3 tens and 2 ones 0 tens and 32 ones

4 tens and 7 ones 0 tens and 47 ones





























Smarter work please



Challenge
 Can you partition 52 in four ways?

Eyuel could partition a range of 2 digit num in 4 ways.

100	
53 ✓	47

			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

Equal could match hundred square halves

$$54 + 46 = 100 \checkmark$$

0	1	19	20	21	29	30	31	39	40	41	49	50	51	59	60	61	69	70	71	79	80	81	89	90	99
2	18	22	38	42	58	62	78	82	98																
3	17	23	37	43	57	63	77	83	97																
4	16	24	36	44	56	64	76	84	96																
5	15	25	35	45	55	65	75	85	95																
6	14	26	34	46	54	66	74	86	94																
7	13	27	33	47	53	67	73	87	93																
8	12	28	32	48	52	68	72	88	92																
9	10	11	29	30	31	49	50	51	59	60	61	69	70	71	79	80	81	89	90	99					

$$52 + 48 = 100 \checkmark$$

100	
28	72 ✓

$$51 + 49 = 100 \checkmark$$

$$50 + 50 = 100 \checkmark$$

$$90 + 10 = 100 \checkmark$$



$$38 + 62 = 100 \checkmark$$

$$30 + 70 = 100 \checkmark$$

$$40 + 60 = 100 \checkmark$$

$$54 + 46 = 100 \checkmark$$

Equal chose to use counting rods to help him

$$44 + 56 = 100 \checkmark$$

$$83 + 17 = 100 \checkmark$$



Think about the best way to show your working out

100	
75 ✓	25

100	
69	31 ✓

Challenge 51016



Which coins would you need to add to make £1.00?



$$\begin{array}{r} 0 \\ + 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} + 5 \\ \hline 7 \end{array}$$

7/10/16 (Mental
I can read and w
I can read and w
I can represent

Number

23

16

38

Ch

$$6 = \frac{1}{2}$$

$$\begin{array}{r} + \\ \hline 4 \end{array}$$

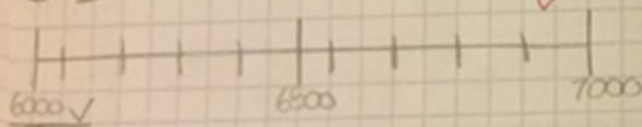
$$\begin{array}{r} 10 \\ 5 \\ \hline 15 \end{array}$$

22/09/16 I can round numbers to the nearest 1000.

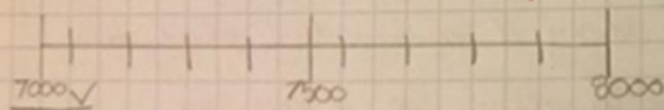
This is how I think you round to the nearest 1000:

- Look at your number and find the 1000 before the number.
- Find the 1000 after your number.
- Put in the halfway point if needed.
- Look at what number you have in the hundreds column.
- If four or below round down, if five or above round up.

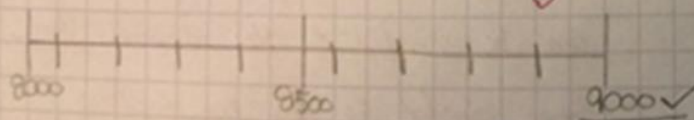
① 6482 to the nearest thousand is 6000



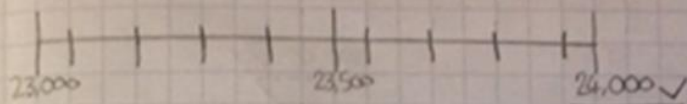
② 7329 to the nearest thousand is 7000



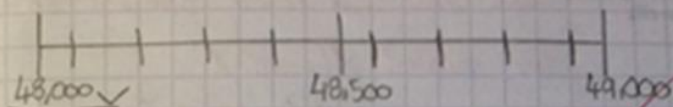
③ 8841 to the nearest thousand is 9000



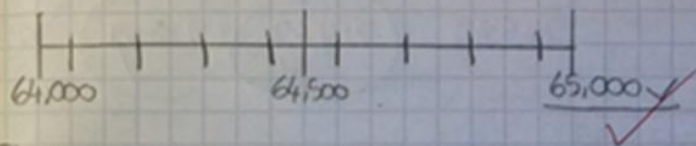
④ $23,697$ to the nearest thousand is $24,000$



⑤ $48,112$ to the nearest thousand is $48,000$



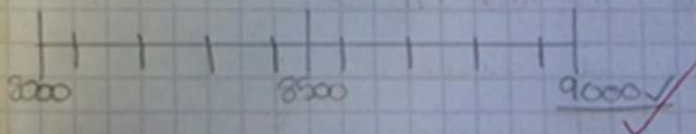
⑥ $64,713$ to the nearest thousand is $65,000$



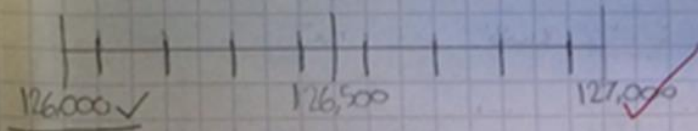
Challenge:

Round these numbers to the nearest thousand.

① 8992 to the nearest thousand is 9000 .



② $126,134$ to the nearest thousand is $126,000$



Reasoning addition question 1

Captain Conjecture says, 'When working with whole numbers, if you add two 2-digit numbers together the answer cannot be a 4-digit number.'

Do you agree?

Explain your reasoning.

Reasoning addition question 2

Convince me

Convince me

$$\boxed{} + 1475 = 6\boxed{}24$$

What numbers go in the boxes?
What different answers are there?
Convince me

1) I agree because $99 + 99$
which is 198.

$$\begin{array}{r} 2) 1\overset{1}{4}\overset{1}{7}\overset{1}{5} \quad 1\overset{1}{4}\overset{1}{7}\overset{1}{5} \\ + 5349 \quad + 5049 \\ \hline 6824 \quad 6524 \end{array}$$

How much more does it cost for two adults to make a single journey to Hull than to Leeds?

Adult		York	Hull	Leeds
	Single	£11.50	£16.60	£11.00
Return	£24.50	£36.00	£26.00	
Child	Single	£9.75	£11.00	£8.00
	Return	£15.00	£18.50	£13.50

$$\begin{array}{r} 1) 24.50 \\ + 15.00 \\ \hline 39.50 \\ + 15.00 \\ \hline 54.50 \end{array}$$

The difference is

$$\begin{array}{r} 2) 16.60 \\ + 16.60 \\ \hline 33.20 \end{array}$$

$$\begin{array}{r} 11.00 \\ + 11.00 \\ \hline 22.00 \end{array}$$

$$\begin{array}{r} 33.20 \\ - 22.00 \\ \hline 11.20 \end{array}$$

12.10.16

To use column addition to

**LO: I can count forwards and backwards in powers of 10

177 000	187 000	188 000	207 000
---------	---------	---------	---------

Can you spot the mistake?

The mistake is that you were supposed to add 10000
but in the third number 1000 has been added ✓



What went well:

Excellent reasoning Stacey!

***LO: To count forwards and backwards in powers of 10

••LO: I can round numbers to the nearest 1000 and 10000

Round the number 259996 to the nearest 1000. Round it to the nearest 10000. What do you notice about the answers?

When rounding to the nearest 1000 and 10,000 we found out that they have the same answer. They both round up to 260000. As long as, our thousands and hundred have 9 in it we round up. Excellent reasoning!

Can you think of 3 more numbers where the same thing would happen?

1. 468998

2. 758996

3. 654992

For this to work the thousands and hundreds needs a 9 in both of their column,

But you haven't put 9's in the thousands and hundreds columns?? Can you correct?



Even better if:

469985

759966

659922

// V. good!