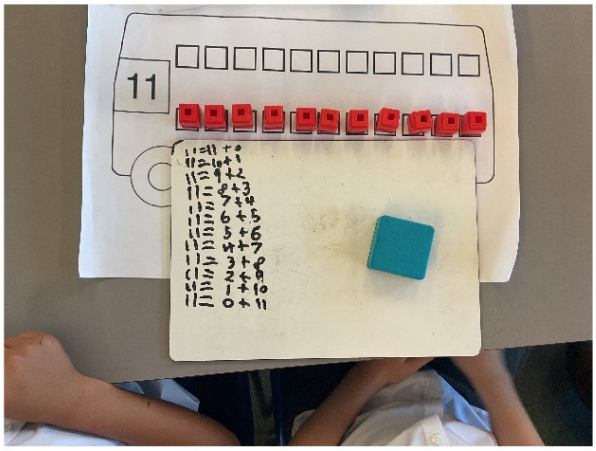
Y2 Mathematics Workshop



Aims of today

HS

To learn about teaching for mastery

To understand the key objectives for Y2

To focus on developing fluency of addition and subtraction facts

The importance of number bonds and addition/subtraction facts

The methods for teaching addition, subtraction, multiplication and division

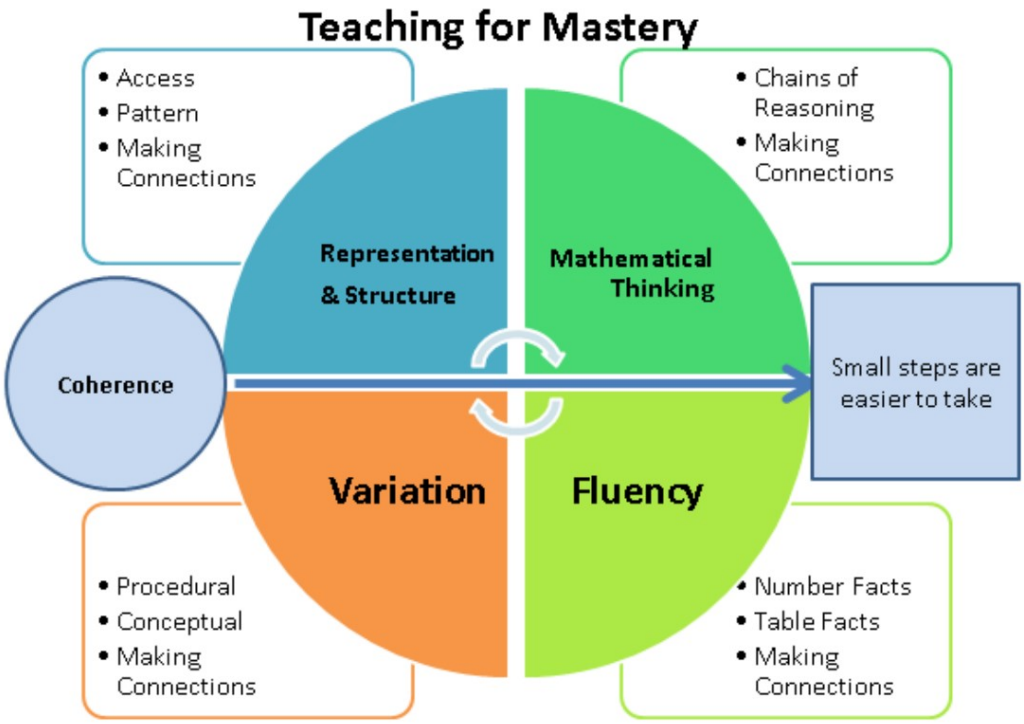
How to help at home

HS

The maths mastery approach

HS

The five big ideas



NCETM
NATIONAL CENTRE FOR EXCELLENCE IN THE TEACHING OF MATHEMATICS

White Rose Maths

HS

The Y2 key objectives

HS

Number – number and place value

Statutory requirements

Pupils should be taught to:

- count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
- recognise the place value of each digit in a two-digit number (tens, ones)
- identify, represent and estimate numbers using different representations, including the number line
- compare and order numbers from 0 up to 100; use <, > and = signs
- read and write numbers to at least 100 in numerals and in words
- use place value and number facts to solve problems.

HS

Number – addition and subtraction

Statutory requirements

Pupils should be taught to:

- solve problems with addition and subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
  - applying their increasing knowledge of mental and written methods
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and ones
  - a two-digit number and tens
  - two two-digit numbers
  - adding three one-digit numbers
- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

HS

Number – multiplication and division

Statutory requirements

Pupils should be taught to:

- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

HS

Number – fractions

Statutory requirements

Pupils should be taught to:

- recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity
- write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.

HS

Measurement

Statutory requirements

Pupils should be taught to:

- choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- compare and order lengths, mass, volume/capacity and record the results using >, < and =
- recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- find different combinations of coins that equal the same amounts of money
- solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
- compare and sequence intervals of time
- tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
- know the number of minutes in an hour and the number of hours in a day.

HS

Geometry – position and direction

Statutory requirements

Pupils should be taught to:

- order and arrange combinations of mathematical objects in patterns and sequences
- use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).

Statistics

Statutory requirements

Pupils should be taught to:

- interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- ask and answer questions about totalling and comparing categorical data.

CS

Fluency in Y2

CS

If children are not fluent in basic addition and subtraction facts, then when solving complex problems the working memory is taken up by calculating basic facts and children have less working memory to focus on solving the actual problem.

What do we want by the end of Y2?

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Children to know the number bonds of numbers from 1-20

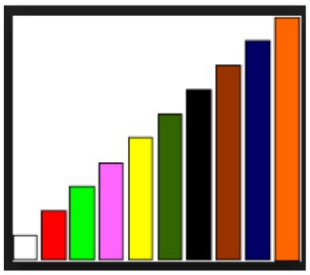
Basic addition facts

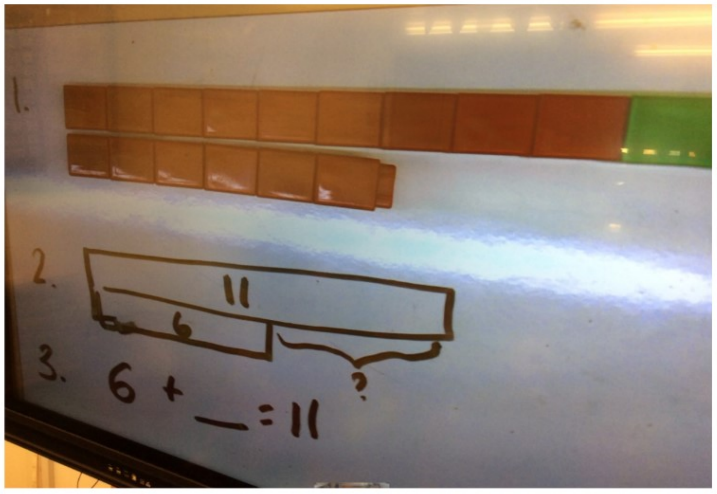
Basic subtraction facts

Number bonds

CS

It is essential that children first work with concrete objects to understand and work out the bonds.





Number bonds

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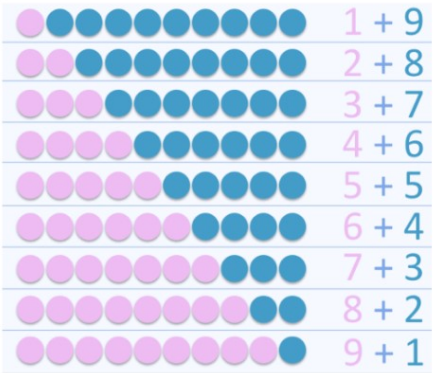
How many ways? (Using resources)

Writing bonds systematically and discussing patterns

Learning the bonds from memory



Using and applying this knowledge

Basic addition facts

CS

0+0	1+0	2+0	3+0	4+0	5+0	6+0	7+0	8+0	9+0	10+0
0+1	1+1	2+1	3+1	4+1	5+1	6+1	7+1	8+1	9+1	10+1
0+2	1+2	2+2	3+2	4+2	5+2	6+2	7+2	8+2	9.2	10+2
0+3	1+3	2+3	3+3	4+3	5+3	6+3	7+3	8+3	9+3	10+3
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0+8	1+8	2+8	3+8	4+8	5+8	6+8	7+8	8+8	9+8	10+8
0+9	1+9	2+9	3+9	4+9	5+9	6+9	7+9	8+9	9+9	10+9
0+10	1+10	2+10	3+10	4+10	5+10	6+10	7+10	8+10	9+10	10+10

Basic subtraction facts

CS

1+0	2+0	3+0	4+0	5+0	6+0	7+0	8+0	9+0	10+0
1+1	2+1	3+1	4+1	5+1	6+1	7+1	8+1	9+1	10+1
1+2	2+2	3+2	4+2	5+2	6+2	7+2	8+2	9.2	10+2
1+3	2+3	3+3	4+3	5+3	6+3	7+3	8+3	9+3	10+3
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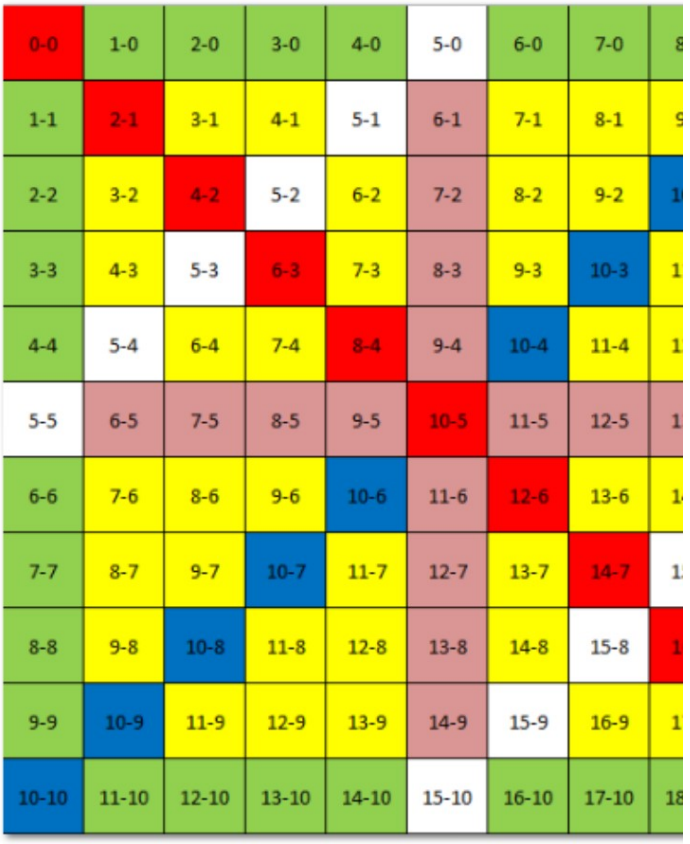
1+10	2+10	3+10	4+10	5+10	6+10	7+10	8+10	9+10	10+10



0-0	1-0	2-0	3-0	4-0	5-0	6-0	7-0	8
1-1	2-1	3-1	4-1	5-1	6-1	7-1	8-1	9
2-2	3-2	4-2	5-2	6-2	7-2	8-2	9-2	1
3-3	4-3	5-3	6-3	7-3	8-3	9-3	10-3	1
4-4	5-4	6-4	7-4	8-4	9-4	10-4	11-4	1
5-5	6-5	7-5	8-5	9-5	10-5	11-5	12-5	1
6-6	7-6	8-6	9-6	10-6	11-6	12-6	13-6	1
7-7	8-7	9-7	10-7	11-7	12-7	13-7	14-7	1
8-8	9-8	10-8	11-8	12-8	13-8	14-8	15-8	1
9-9	10-9	11-9	12-9	13-9	14-9	15-9	16-9	1
10-10	11-10	12-10	13-10	14-10	15-10	16-10	17-10	18

CS

How to help at home

Incorporate maths into daily routines

CS

Counting forwards and backwards

Measures in everyday play

Shape hunts
Direction games

"I'm thinking of a number"

Fluency of bonds, addition and subtraction facts

Positive messages about maths

HS

Do not praise children for being 'clever'.

Praise given for hard work.

Let children know that they can improve.

Make maths fun!

Be positive about maths yourself!

Regular and often

HS

Raise the profile of maths in line with reading.

Work on number bonds and basic addition and subtraction fluency in particular.

Follow the home learning letter information to continue to add to skills.

Learning next week	**Science:** We start our new unit on plants and we will be learning about seeds. **English:** We are starting our new unit based on the book 'The Whale Song' by Dyan Sheldon. **Maths:** We continue our unit on division. We will be dividing by 5 and 10. We will also be looking at number families (multiplication and division) and worded division problems.

CS

Written methods in Year 2

Number – addition and subtraction

CS

Statutory requirements

Pupils should be taught to:

- solve problems with addition and subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
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- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and ones
  - a two-digit number and tens
  - two two-digit numbers
  - adding three one-digit numbers
- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

CS

Partitioning is when you split numbers up into smaller numbers that have the same total value. For example:

$$36 = 30 + 6$$
$$36 = 20 + 16$$
$$36 = 10 + 26$$

Addition - 1 digit add 1 digit

CS

$$4 + 3 =$$

Addition - 2 digit add 1 digit

$$24 + 3 =$$

Addition - 2 digit add a multiple of ten

CS

$$40 + 30 =$$

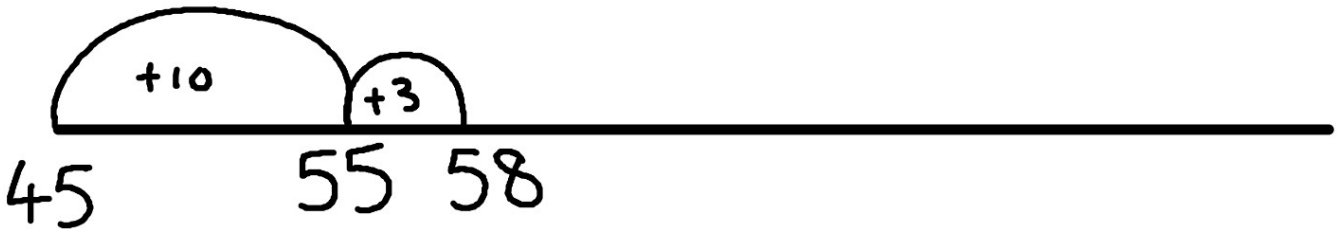
Addition - 2 digit add 2 digit -

When adding, if the numbers are far apart, we recommend adding on a number line.

$$45 + 13 = 58$$

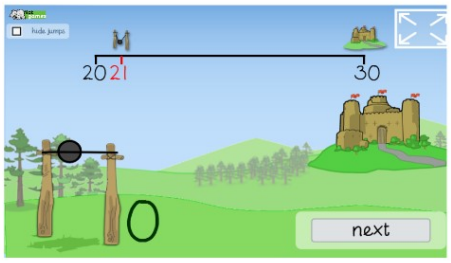
$$13 \rightarrow 10 \;\; 3$$

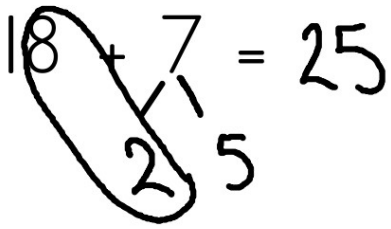
alternative methods
- count forwards

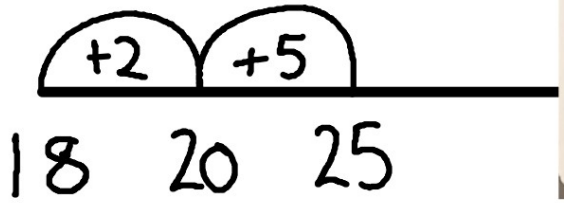


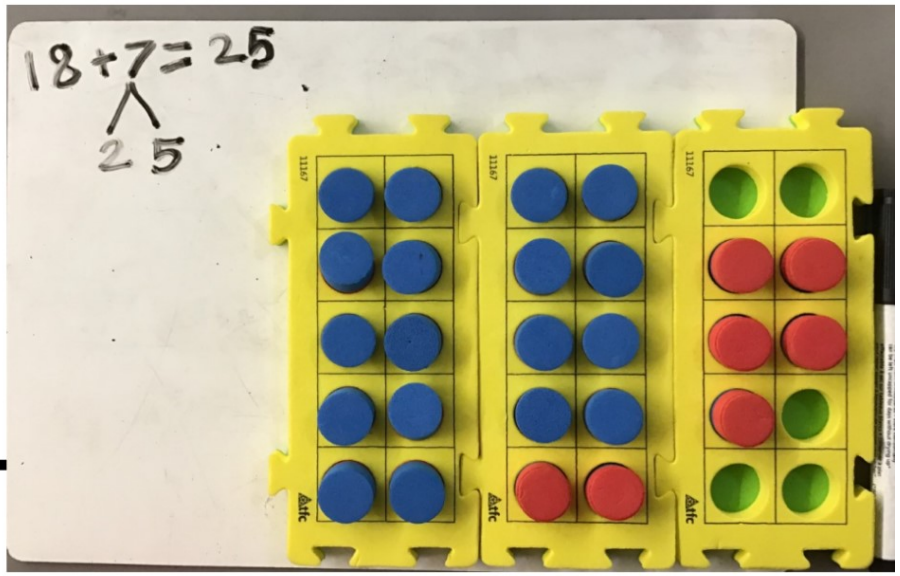
Addition - 2 digit add 1 digit - bridging through 10

CS







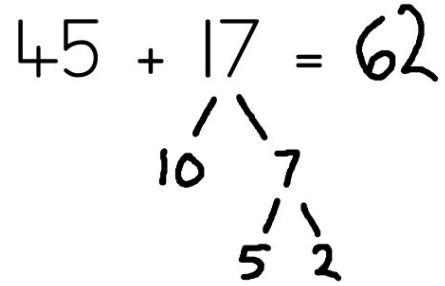


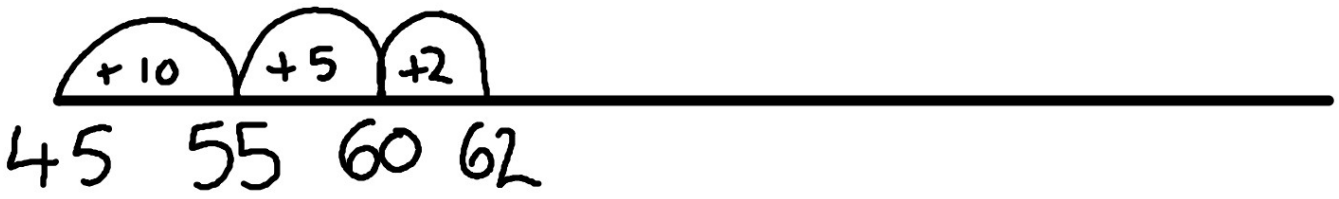
Addition - 2 digit add 2 digit - bridging through 10

When adding, if the numbers are far apart, we recommend adding on a number line.

CS

alternative methods
- compensate





Addition - 2 digit add 2 digit

CS

When adding 2, 2-digit numbers together we encourage the children to partition the numbers (into tens and ones) to make it more manageable.

$$25 + 34 = 59$$

20	+	5
30	+	4
50	+	9

Addition - 2 digit add 2 digit

CS

When adding 2, 2-digit numbers together we encourage the children to partition the numbers (into tens and ones)to make it more manageable.

$$28 + 34 = 62$$

20	+	8
30	+	4
50	+	12

10 2

Bridging 10

HS

Subtraction - 1 digit subtract 1 digit

$$5 - 2 =$$

Subtraction - 2 digit subtract 1 digit

$$25 - 2 =$$

Subtraction - 2 digit minus a multiple of ten

HS

$$50 - 20 =$$

What number facts can I use to help me?

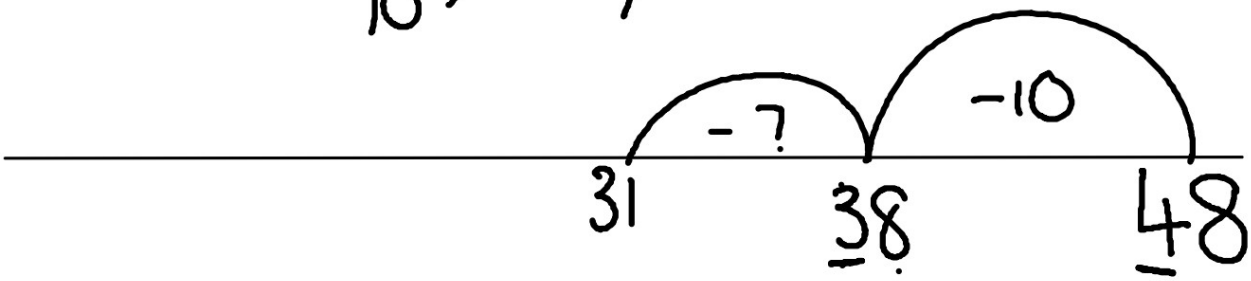
HS

Subtraction - 2 digit subtract 2 digit

When subtracting a two digit number from a two digit number use a number line.

48 - 17 =

10 7



HS

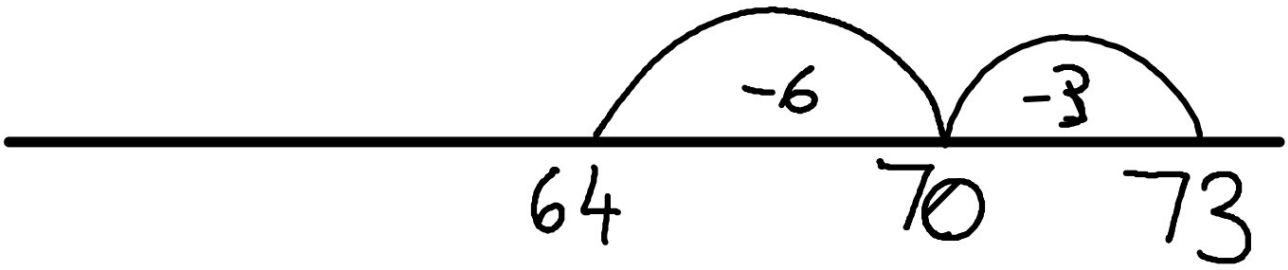
Subtraction - 2 digit subtract 1 digit - bridging through 10

When subtracting, if the numbers are far apart we recommend subtracting on a number line.

$$73 - 9 = \_$$

$$3 \quad 6$$

alternative methods
- count back
- compensate

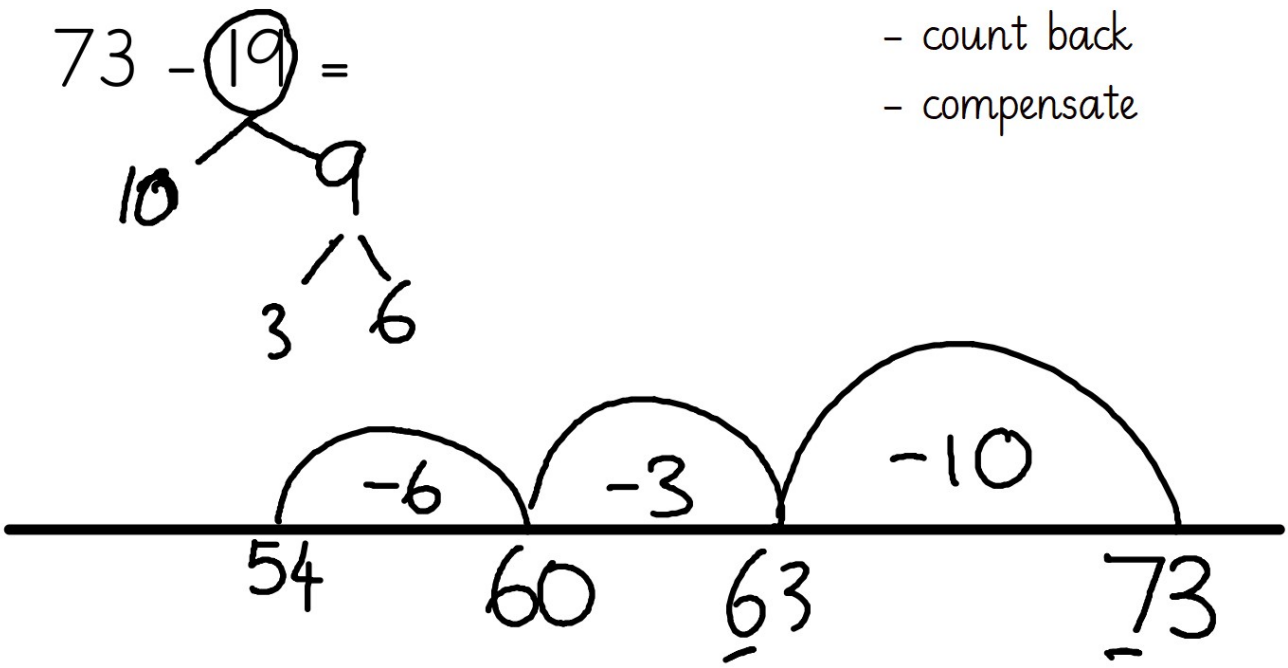


Subtraction - 2 digit subtract 2 digit - bridging through 10

HS

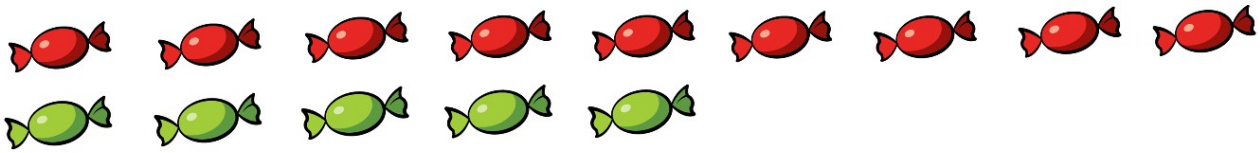
When subtracting, if the numbers are far apart, we recommend subtracting on a number line.

alternative methods
- count back
- compensate



Subtraction - Finding the difference

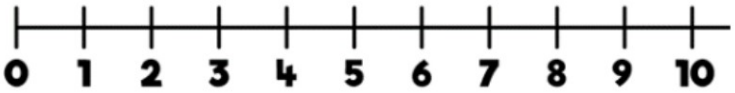
HS



How many green sweets are there? ___

How many red sweets are there? ___

Complete the bar model and show the jumps on the number line.



The difference is ___ .

There are ___ fewer green sweets than red sweets.

There are ___ more red sweets than green sweets.

HS

Number – multiplication and division

Statutory requirements

Pupils should be taught to:

- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Multiplication

CS

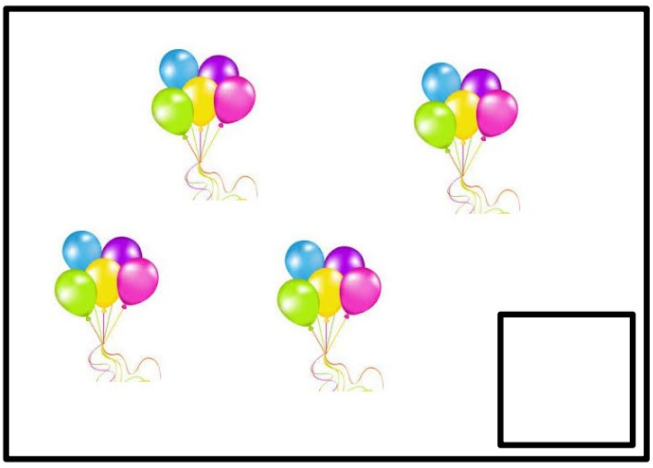
By the end of Year 2 the children must be fluent with the 2, 5 and 10 times tables. They must also be familiar with the 3 times table.

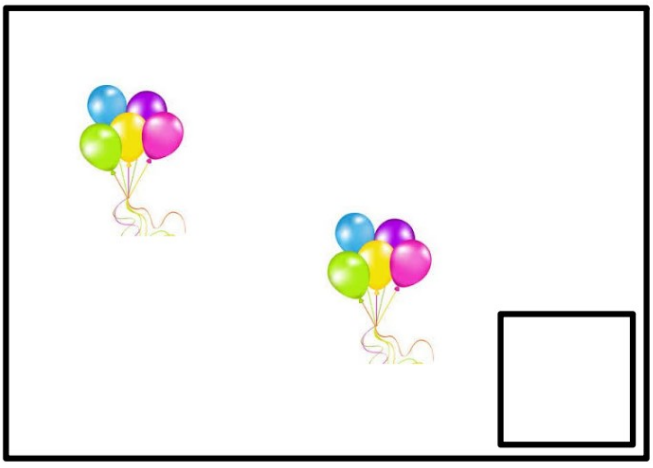
$$3 \times 5 = 15$$

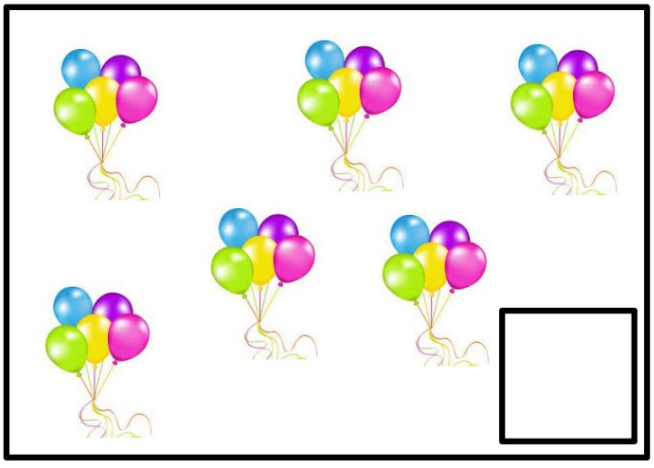
$$5 \times 3 = 15$$

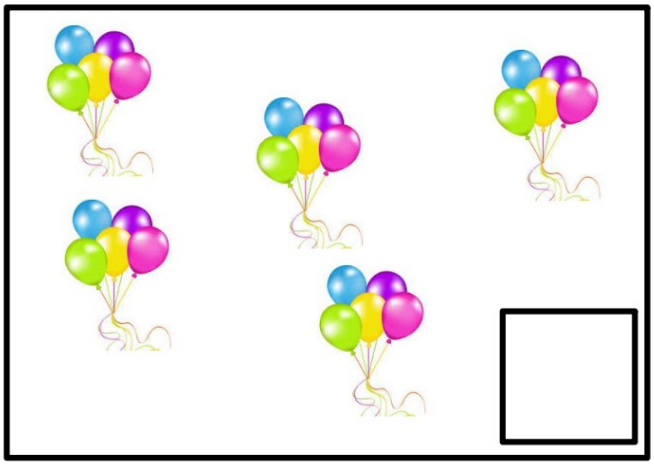
CS

Multiplication - Ideas from lessons









New

CS

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

CS

We are learning to count in fives

0, 5, 10, 15, 20, ___

15, 20, 25, ___, 35, 40

55, 60, 65, 70, 75, ___

20, 15, ___, 5, 0

85, 80, 75, 70, ___, 60

60, ___, 50, 45, 40, 35

New

CS

New

CS

2 x 5 = 10

New

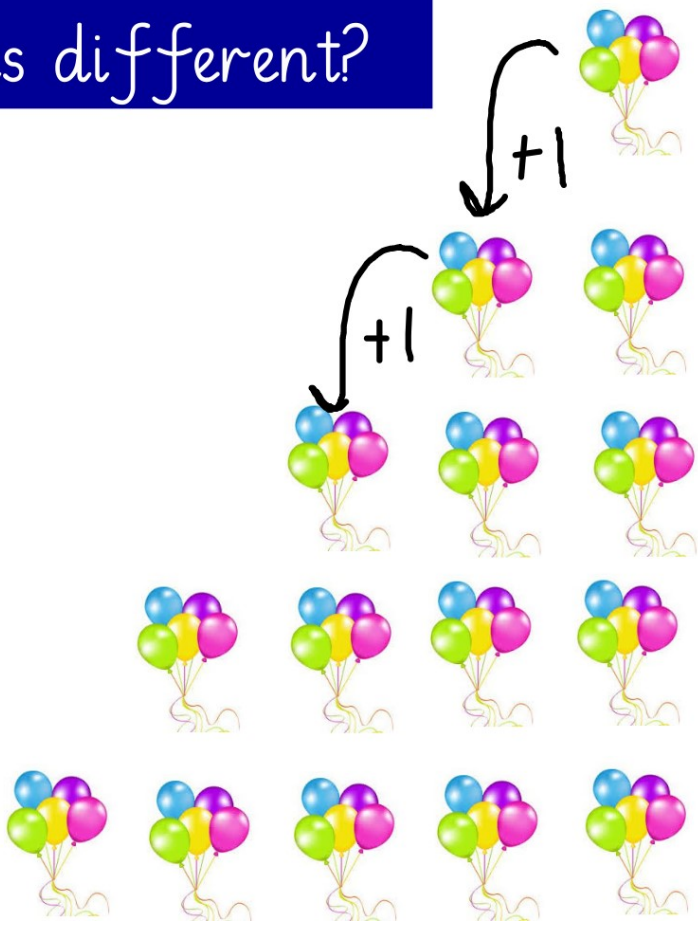
CS

3 x 5 = 15

What do you notice?
What is the same?
What is different?

New

CS



1 x 5 = 5

2 x 5 = 10

3 x 5 = 15

4 x 5 = 20

5 x 5 = 25

Develop

CS

Multiplication is commutative!

It can be done in any order, just like addition.

$$2 \times 5 = 10$$

$$5 \times 2 = 10$$

The position of the factors can change and the product stays the same.

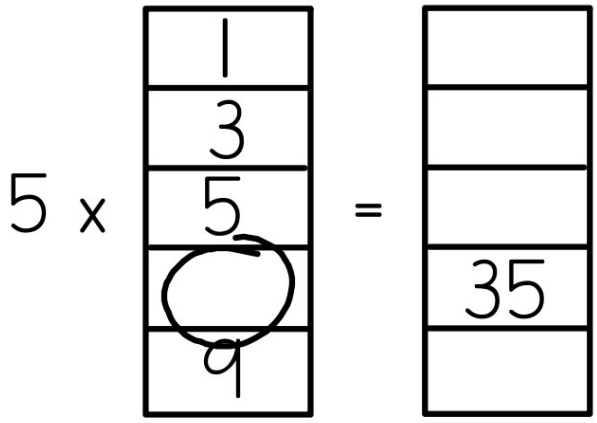
When you change the position of the factors, the product stays the same!

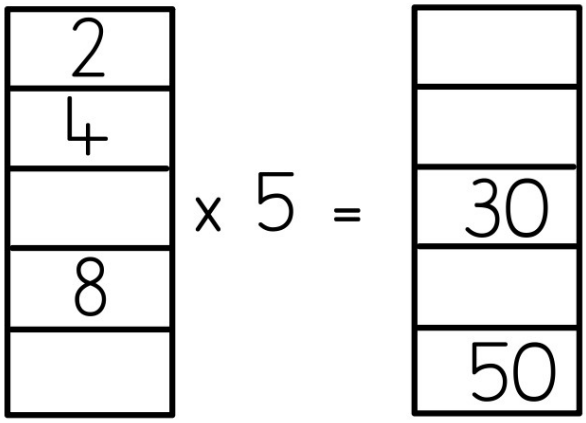
CS

1 x 5 = 5	5 x 1 = 5
2 x 5 = 10	5 x 2 = 10
3 x 5 = 15	5 x 3 = 15
4 x 5 = 20	5 x 4 = 20
5 x 5 = 25	5 x 5 = 25
6 x 5 = 30	5 x 6 = 30
7 x 5 = 35	5 x 7 = 35
8 x 5 = 40	5 x 8 = 40
9 x 5 = 45	5 x 9 = 45
10 x 5 = 50	5 x 10 = 50
11 x 5 = 55	5 x 11 = 55
12 x 5 = 60	5 x 12 = 60

We are learning to solve missing number problems using our knowledge of multiplying by five

CS





0 x 5 =

40 = x 5

5 x 3 =

50 = 5 x

Division

HS

By the end of Year 2 the children must be fluent with all related division facts for the 2, 5 and 10 times table. They must also be familiar with division facts for the 3 times table.

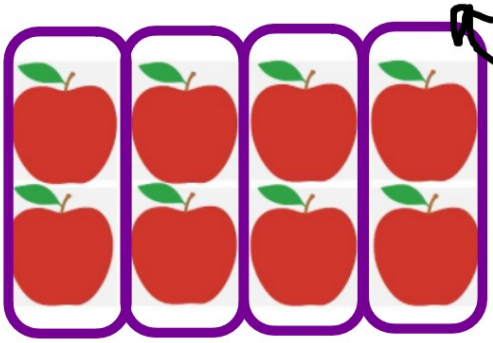
We link this to multiplication.

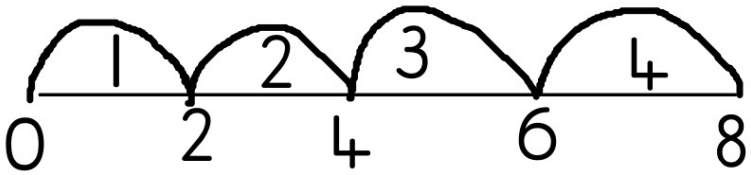
Division

HS

We teach the children division initially as grouping.

$8 \div 2 = 4$





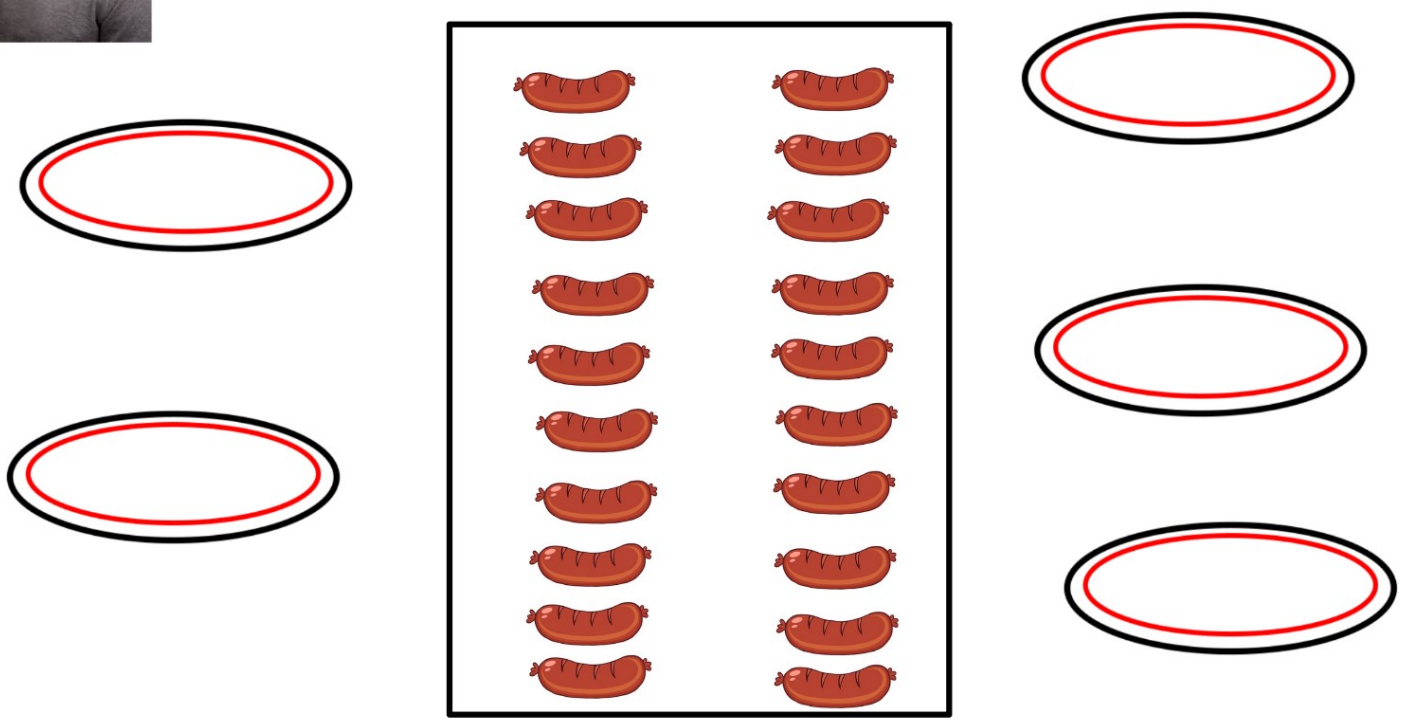
grouped in

divided into groups of

Sharing

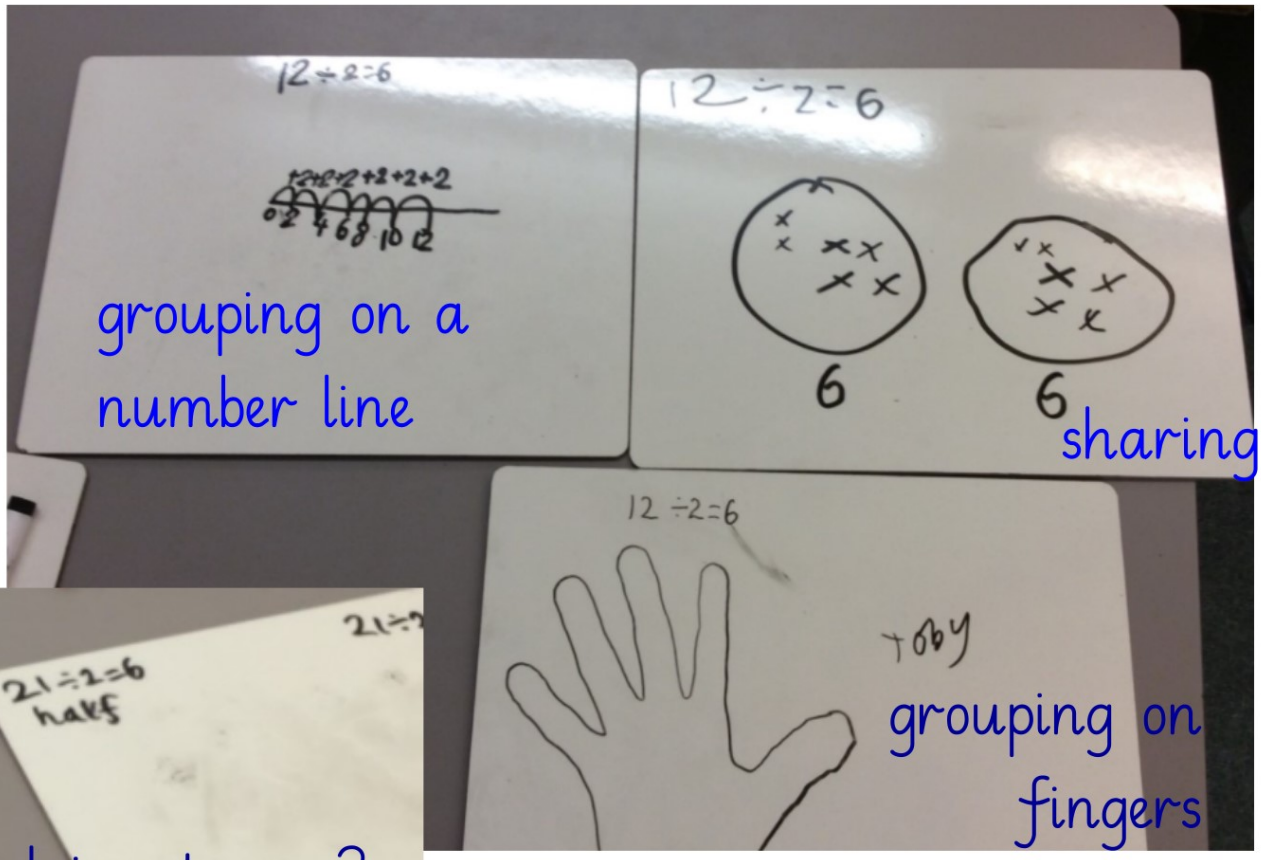
There are 20 sausages. 20 is the whole.
We need to put the sausages equally on all 5 plates.

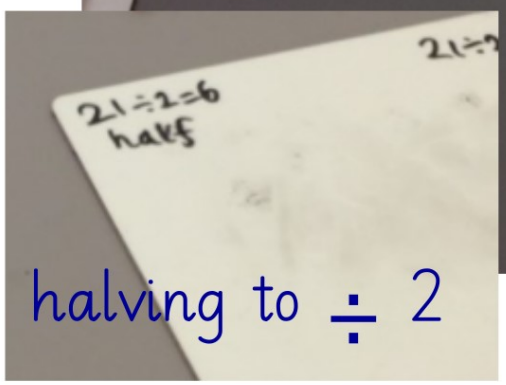
$$20 \div 5 = 4$$



12 ÷ 2 = 6

HS


12÷2=6
grouping on a number line
12÷2=6
6
6
sharing
12 ÷2=6
Toby
grouping on fingers


21÷2=6
half
halving to ÷ 2

Fact families

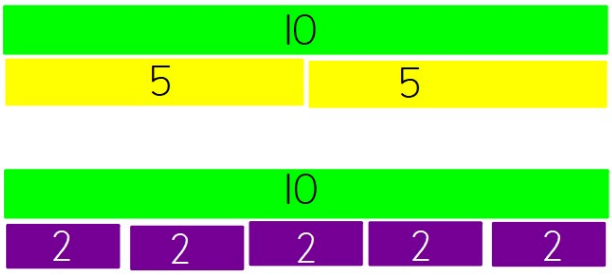
HS

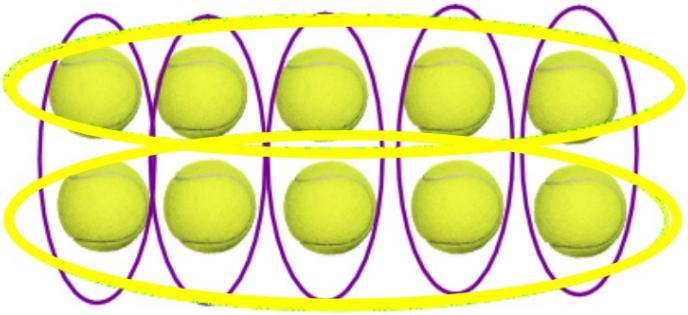
$2 \times 5 = 10$

$5 \times 2 = 10$

$10 \div 5 = 2$

$10 \div 2 = 5$





Multiplication and division challenges

HS

1 x 5 = 5
2 x 5 = 10
3 x 5 = 15
4 x 5 = 20
5 x 5 = 25
6 x 5 = 30
7 x 5 = 35
8 x 5 = 40
9 x 5 = 45
10 x 5 = 50

2 x 5 = 10
7 x 5 = 35
4 x 5 = 20
10 x 5 = 50
6 x 5 = 30
5 x 5 = 25
8 x 5 = 40
9 x 5 = 45
3 x 5 = 15
1 x 5 = 5

15 = __ x 5
__ x 5 = 35
___ ÷ 5 = 8
5 x __ = 10
50 = __ x 5
35 ÷ 5 = __
__ x 5 = 5
0 x 5 = ___
6 = ___ ÷ 5
45 ÷ 5 = ___

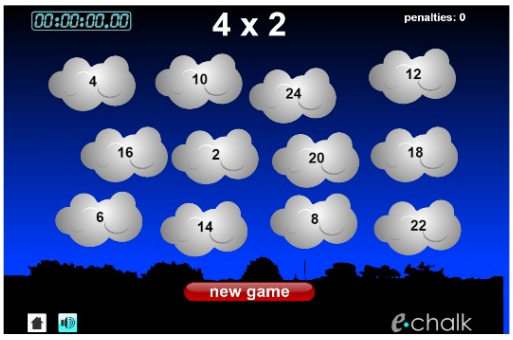
Useful apps / sites

HS

Hit the button

Numbots

Cloud tables



https://www.echalk.co.uk/Maths/tables/cloudTables.html

KS1 Assessments

HS

The KS1 assessments take place in the Summer Term. In maths, children will complete an arithmetic paper and a reasoning paper. They form one part of evidence, along with the continuous teacher assessment that has taken place throughout the year.

- There is now no statutory requirement to carry out the end of key stage 1 (KS1) teacher assessment.
- The Standards and Testing Agency (STA) are, however, continuing to develop and supply printed materials to schools for optional end of KS1 tests
- These are both still valuable tools for assessing pupils at the end of KS1 but now there is no obligation to report these to parents or local authorities so there can be a degree of flexibility as to when and how these are used.

Arithmetic

HS

1 $4 + 2 =$ ☐

2 $19 - 9 =$ ☐

3 $89 + 10 =$ ☐

4 $17 - 6 =$ ☐

5

$15 + 3 + 3 =$ ☐

7

☐ $+ 5 = 9$

HS

18

$\frac{1}{4}$ of $20 =$ ☐

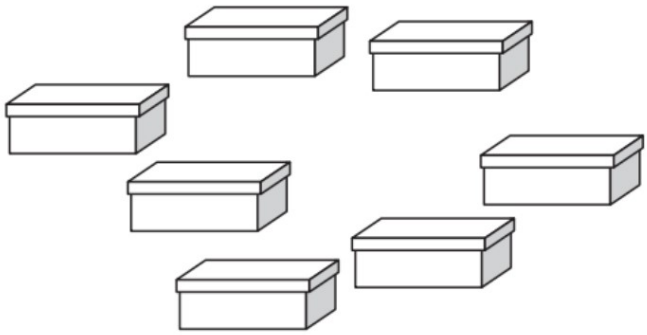
11

$87 - 40 =$ ☐

Reasoning

HS

7



Sita puts **2** shoes in each of these boxes.

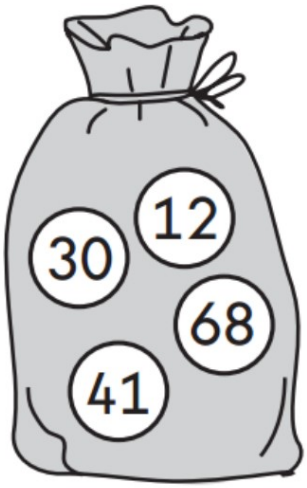
How many shoes are there altogether?

shoes

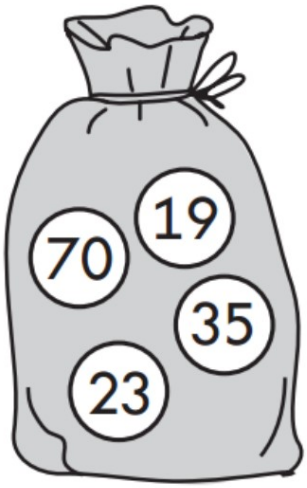
HS

12 **Two** of the numbers are in the **wrong** bag.

Draw a cross (✗) on each of them.



even numbers



odd numbers

HS

8 Complete the table.

words	digits
thirty-eight	38
	40
ninety-four	

HS

19 Amy buys an ice-cream for 90p.

(a) Tick (✓) **three** coins to show how Amy can make **90p**.

(b) Tick (✓) **four** coins to show another way to make **90p**.

HS

28 Abdul goes to the zoo.

He finds out the mass of some animals.

Cheetah
58 kg

Tiger
94 kg

Lion
94 kg

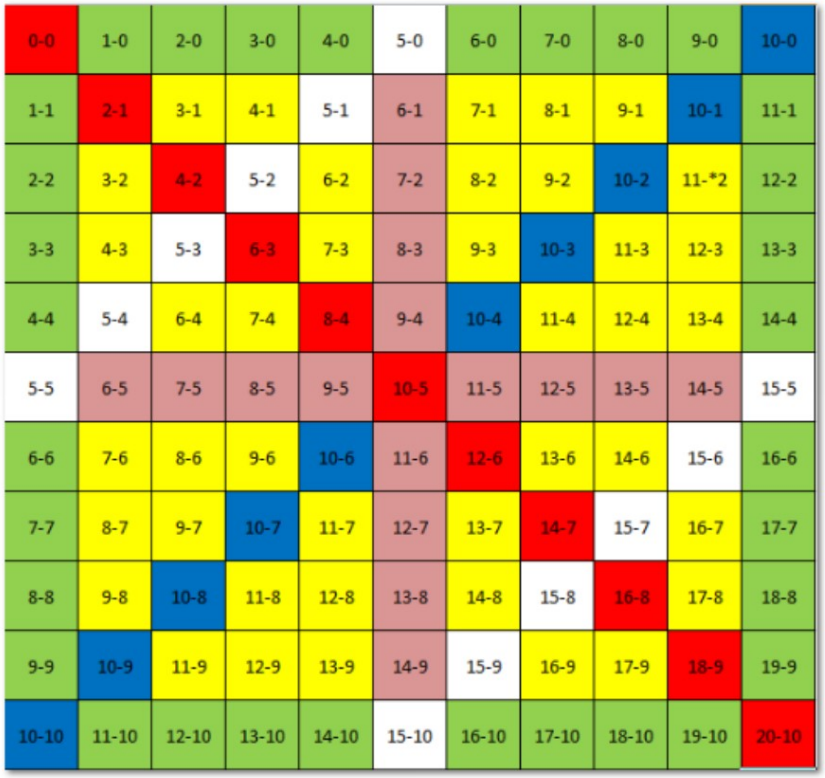
Compare the mass of the animals.

Write **<** or **>** or **=** in each box.

Cheetah's mass ☐ Tiger's mass

Tiger's mass ☐ Lion's mass

Thank you for listening!



0-0	1-0	2-0	3-0	4-0	5-0	6-0	7-0	8-0	9-0	10-0
1-1	2-1	3-1	4-1	5-1	6-1	7-1	8-1	9-1	10-1	11-1
2-2	3-2	4-2	5-2	6-2	7-2	8-2	9-2	10-2	11-*2	12-2
3-3	4-3	5-3	6-3	7-3	8-3	9-3	10-3	11-3	12-3	13-3
4-4	5-4	6-4	7-4	8-4	9-4	10-4	11-4	12-4	13-4	14-4
5-5	6-5	7-5	8-5	9-5	10-5	11-5	12-5	13-5	14-5	15-5
6-6	7-6	8-6	9-6	10-6	11-6	12-6	13-6	14-6	15-6	16-6
7-7	8-7	9-7	10-7	11-7	12-7	13-7	14-7	15-7	16-7	17-7
8-8	9-8	10-8	11-8	12-8	13-8	14-8	15-8	16-8	17-8	18-8
9-9	10-9	11-9	12-9	13-9	14-9	15-9	16-9	17-9	18-9	19-9
10-10	11-10	12-10	13-10	14-10	15-10	16-10	17-10	18-10	19-10	20-10