

Whiteheath Infant School

KS1 (Year1 and 2) Maths Workshop

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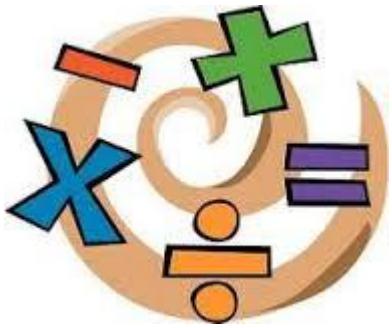






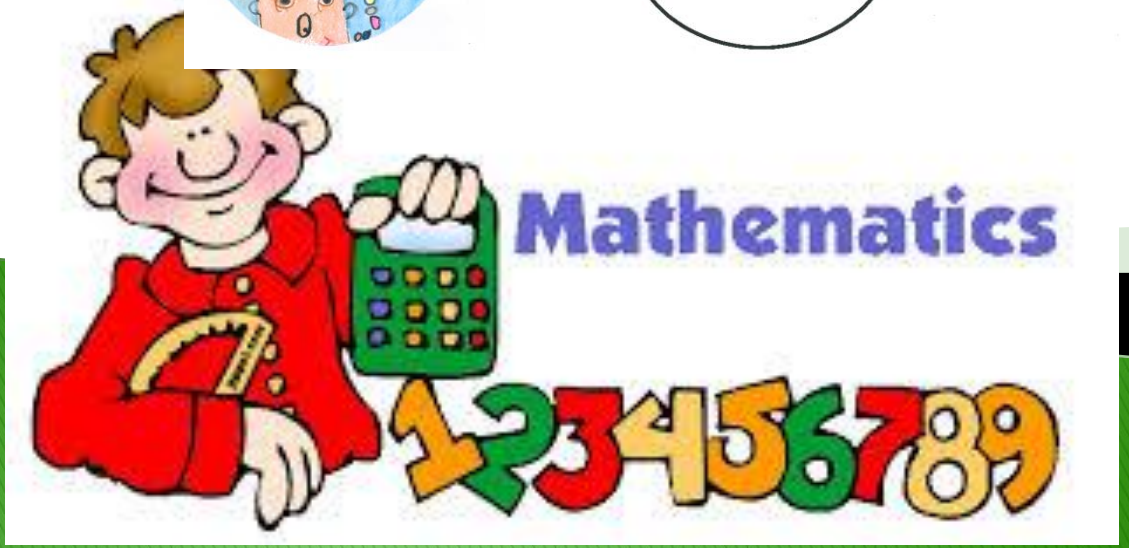
Thinking is at the heart of Mathematics. At Whiteheath Infant school we believe that all children can do Maths.











Aims of the session

- To gain an understanding of the National Maths curriculum and expectations
- To get an insight into how Maths is taught at our school
- To learn about resources we use at school to support children
- To take away some ideas to support your children at home

The '**Rote Memorization – Knowledge**' Fallacy

Explained with **LEGOs**

Rote Memorization → Unconnected, unstable pieces of **knowledge**



Elaboration → Meaningfully interconnected **knowledge**



...Rote memorization does not build



It doesn't mean we don't need



@EfratFurst

What topics are covered in KS1 national Curriculum?

- There are seven fundamental areas of study included in the maths curriculum. These are:

- Number – Number and Place Value
- Number – Addition and Subtraction
- Number – Multiplication and Division
- Number – Fractions
- Measurement
- Geometry – Properties of Shape
- Geometry – Position and Direction

- Statistics– in Year 2

The Maths Curriculum

Children should:

- Become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

- **Reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations and developing an argument, justification or proof using mathematical language.

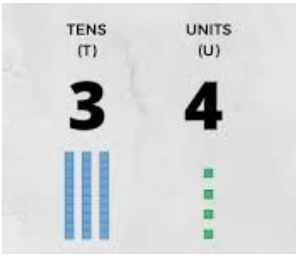
- **Solve problems** by applying their mathematics to a variety of problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Number and Place Value- Year 1



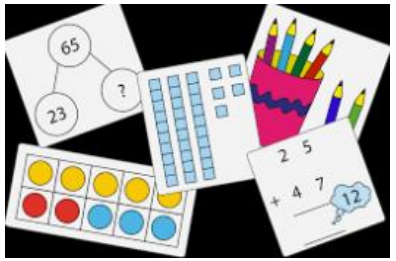
- Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
- Count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens
- Given a number, identify one more and one less
- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
- Read and write numbers from 1 to 20 in numerals and words.

Number and Place Value- Year 2



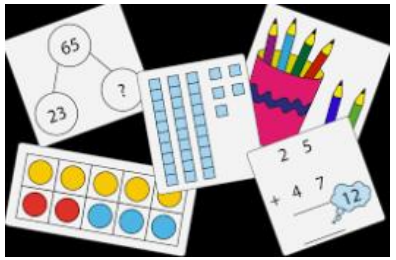
- Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
- Recognise the place value of each digit in a two-digit number (tens, ones)
- Identify, represent and estimate numbers using different representations, including the number line
- Compare and order numbers from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

Number – Addition and Subtraction– Year 1



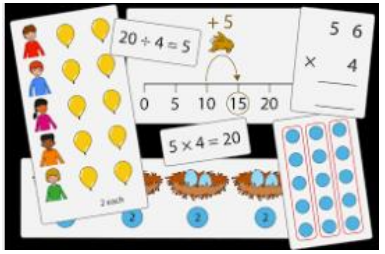
- Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs
- Represent and use number bonds and related subtraction facts within 20
- Add and subtract one-digit and two-digit numbers to 20, including zero
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7= ☐ – 4.

Number – Addition and Subtraction– Year 2



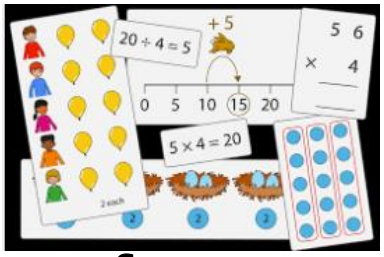
- Solve problems with addition and subtraction; using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- Applying their increasing knowledge of mental and written methods
- Recall and use addition and subtraction facts to 20 fluently, and derive 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.

Number – Multiplication and Division, fractions- Year1



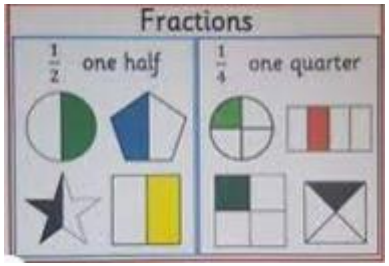
- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.
- Recognise, find and name a half as one of two equal parts of an object, shape or quantity
- Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.

Number – Multiplication and Division, fractions- Year2



- 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.

Fractions- Year 2

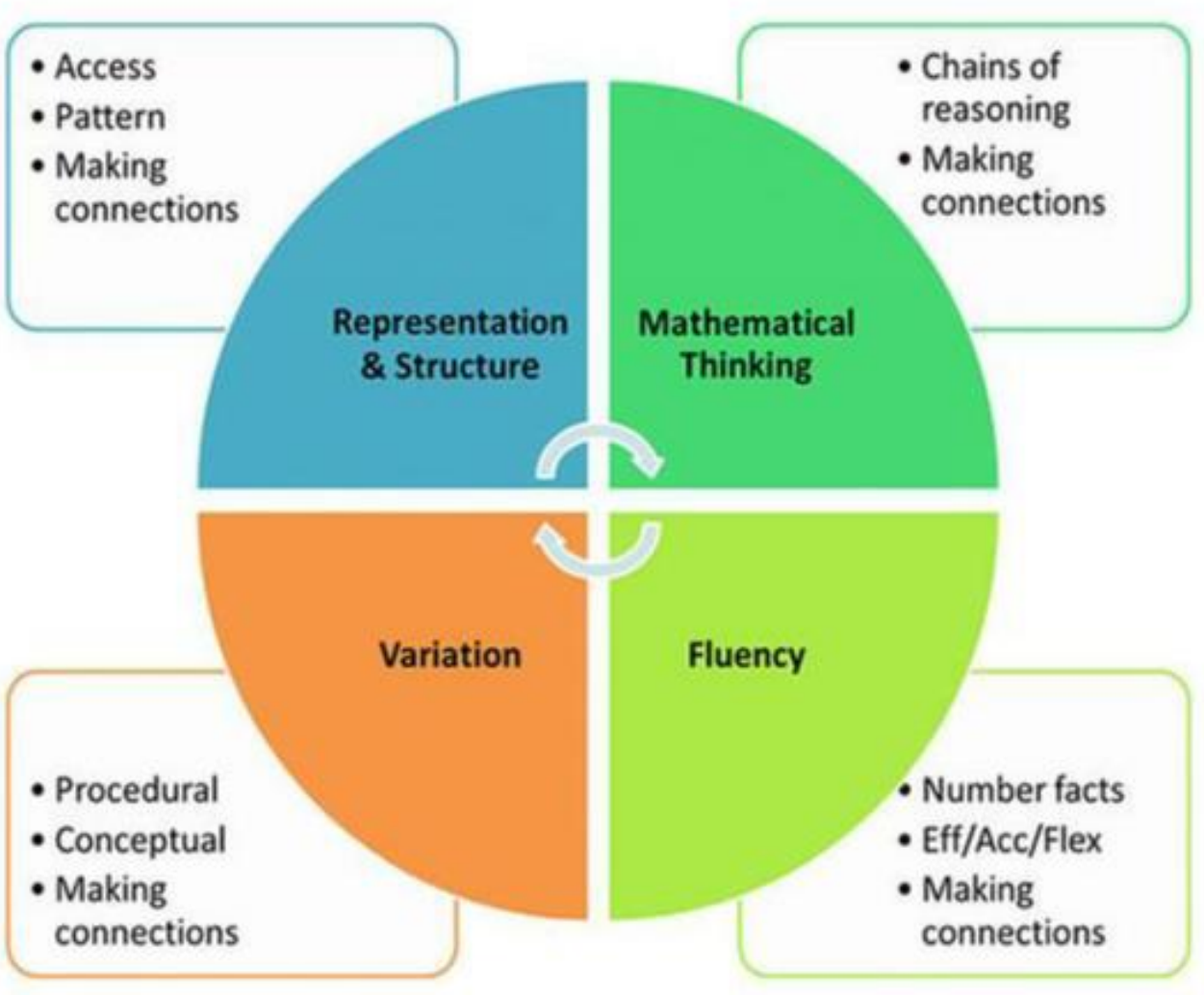


- Recognise, find, name and write fractions 1/3, ¼ , 2/4 and ¾ of a length, shape, set of objects or quantity
- Write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and ½

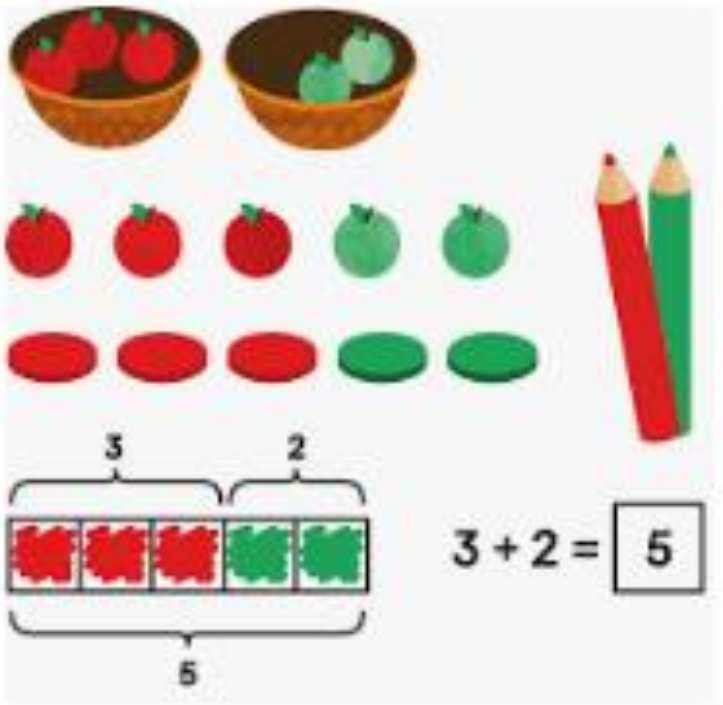
Maths at our school

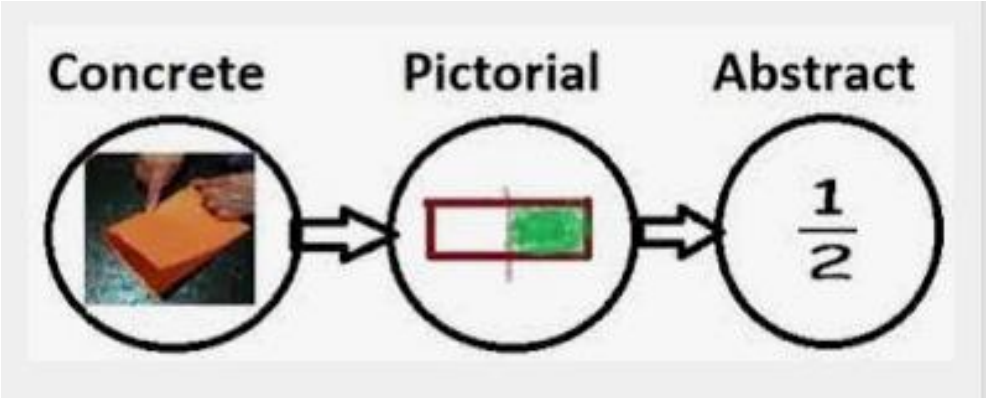
- Whole class teaching using Mastery approach
- Lots of movement between carpet and tables, this incorporates lots of mental maths practice
- Concrete- pictorial- abstract approach used in every lesson
- Fluency practice and reasoning/ problem solving in every lesson
- A wide range of practical resources used

Maths mastery approach



CPA- Concrete, pictorial, abstract approach





4 Find $\frac{1}{2}$ of each number.

Use the arrays to help you.

a)



$\frac{1}{2}$ of 10 = 5

b)



$\frac{1}{2}$ of 16 = 8

c)



$\frac{1}{2}$ of 20 = 10

5 Ron has run 20 m.

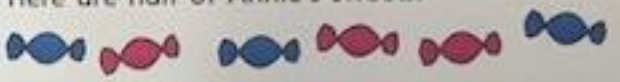


Rosie has run half that distance.

a) Draw an arrow on the running track to show where Rosie is.

a) How far has Rosie run? 10 m

6 Here are half of Annie's sweets.



How many sweets does Annie have in total? 12

Compare answers with a partner.

7 Colour $\frac{1}{2}$ of each shape.

Use the shapes to help you complete the number sentences.

a)



$\frac{1}{2}$ of 24 = 12

b)

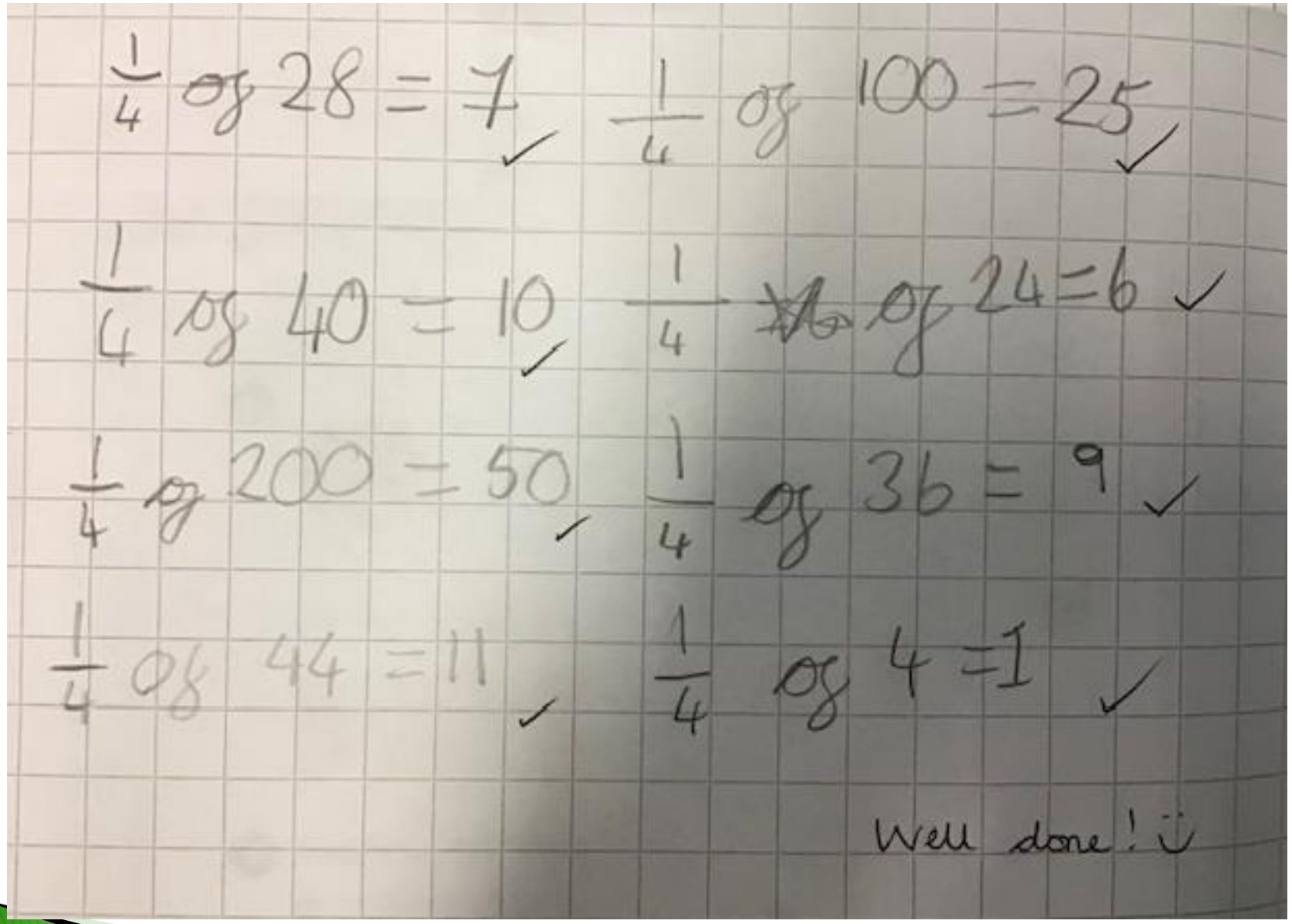


$\frac{1}{2}$ of 18 = 9

8 Complete the number sentences.

$\frac{1}{2}$ of 20 = 10

$\frac{1}{2}$ of 14 = 7

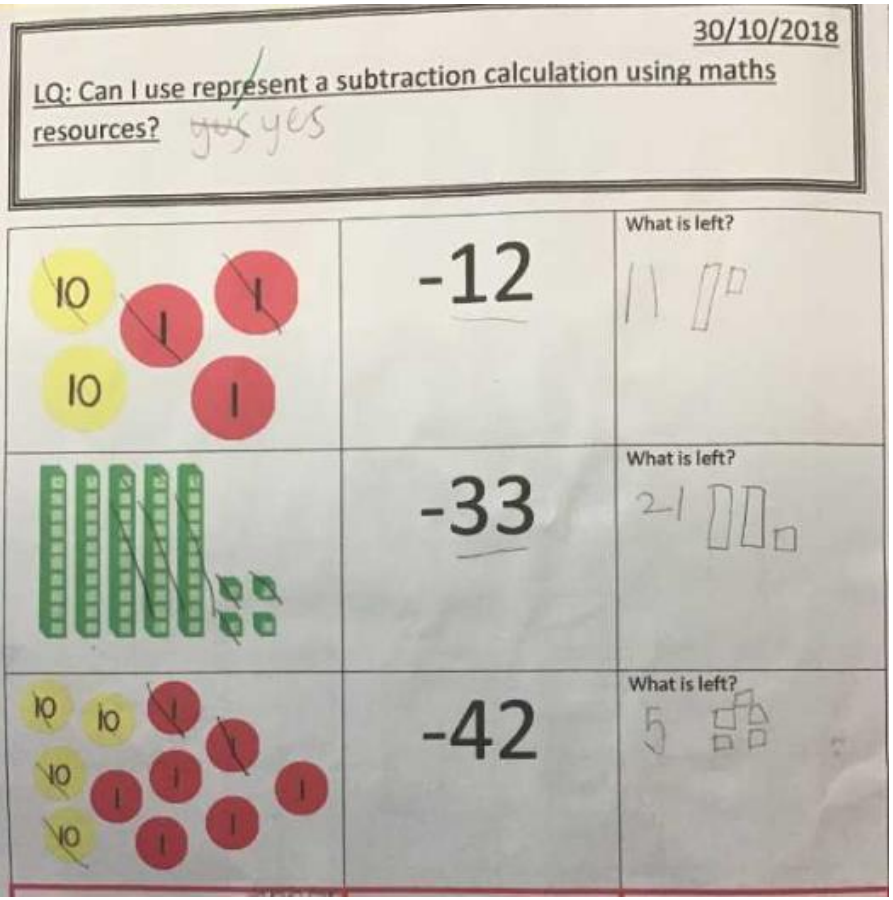

1/4 of 28 = 7
1/4 of 100 = 25
1/4 of 40 = 10
1/4 of 24 = 6
1/4 of 200 = 50
1/4 of 36 = 9
1/4 of 44 = 11
1/4 of 4 = 1
Well done! :)

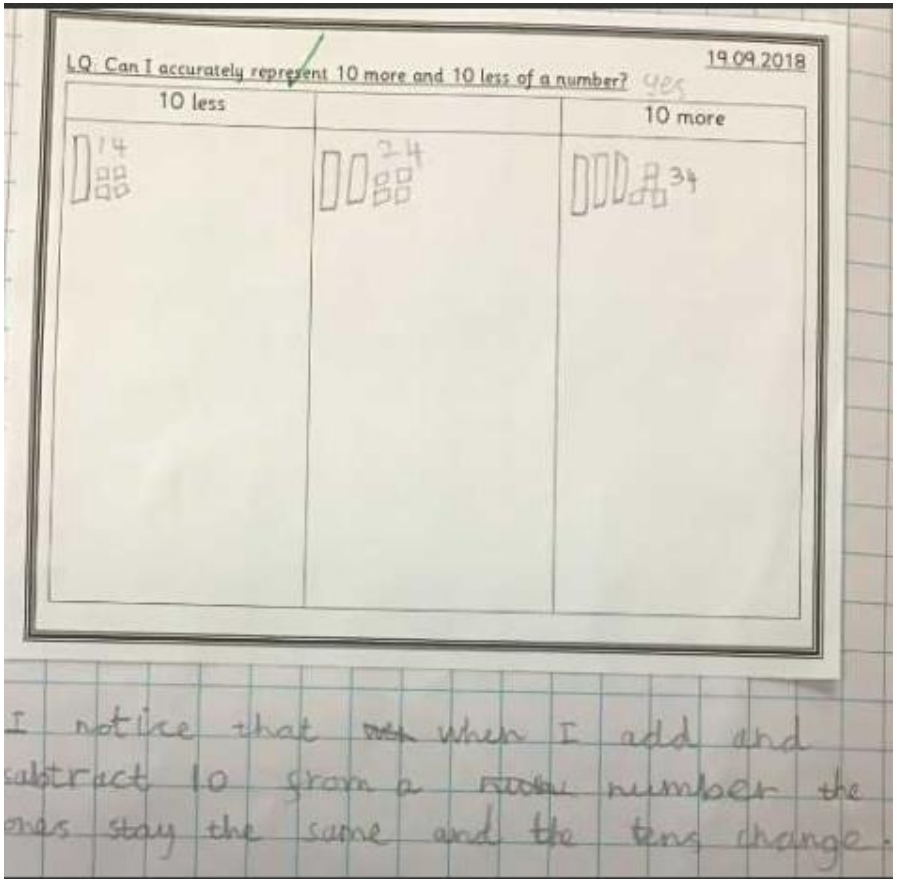
Place Value



- Place value is at the heart of the number system
- All digits have a value and a secure understanding of this will enable children to use and understand different calculation methods
- We constantly ask our children to tell us what each digit in a number represents
- E.g. 24 – The 2 represents 2 tens, the 4 represents 4 ones
- https://www.ictgames.com/sharkNumbers/mobile/index.html

Concrete, Pictorial to Abstract





23-12=11

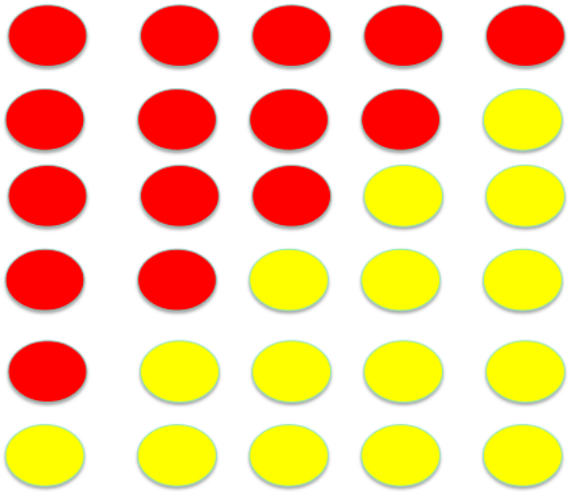
24 + 10 =

24 - 10 =

Fluency

- It is important that children recognise number bonds, different pairs of numbers with the same total and that they are fluent in this
- Children need to be secure on bonds to 10 by the end of Year 1
- Once children are secure on number bonds they are then able to apply this to derived number facts.

How many ways to make 5?



5 red and 0 yellow

4 red and 1 yellow

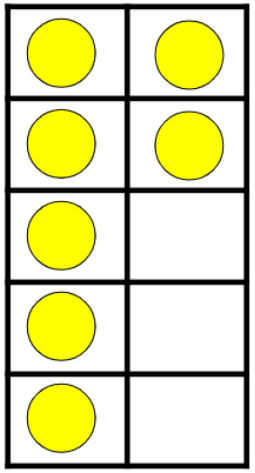
3 red and 2 yellow

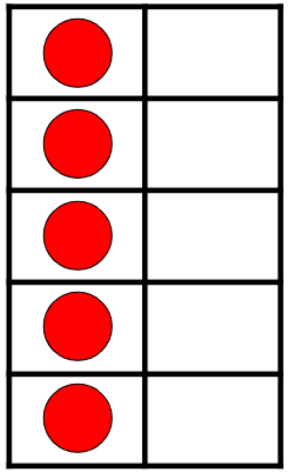
2 red and 3 yellow

1 red and 4 yellow

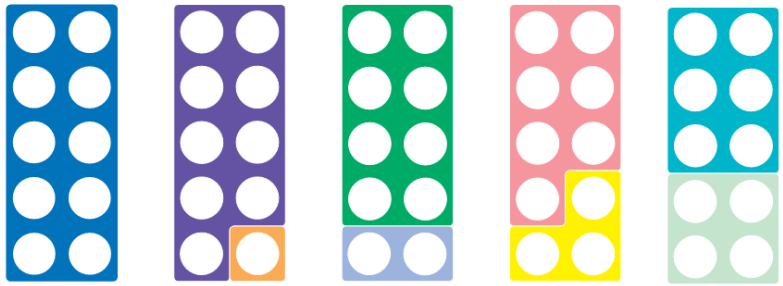
0 red and 5 yellow

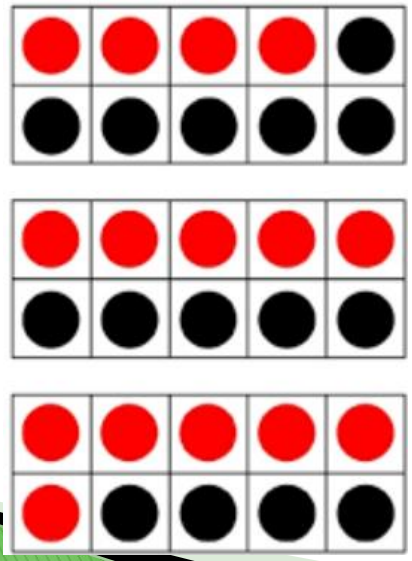
Using known facts.
What facts do you need to solve 7 + 5?

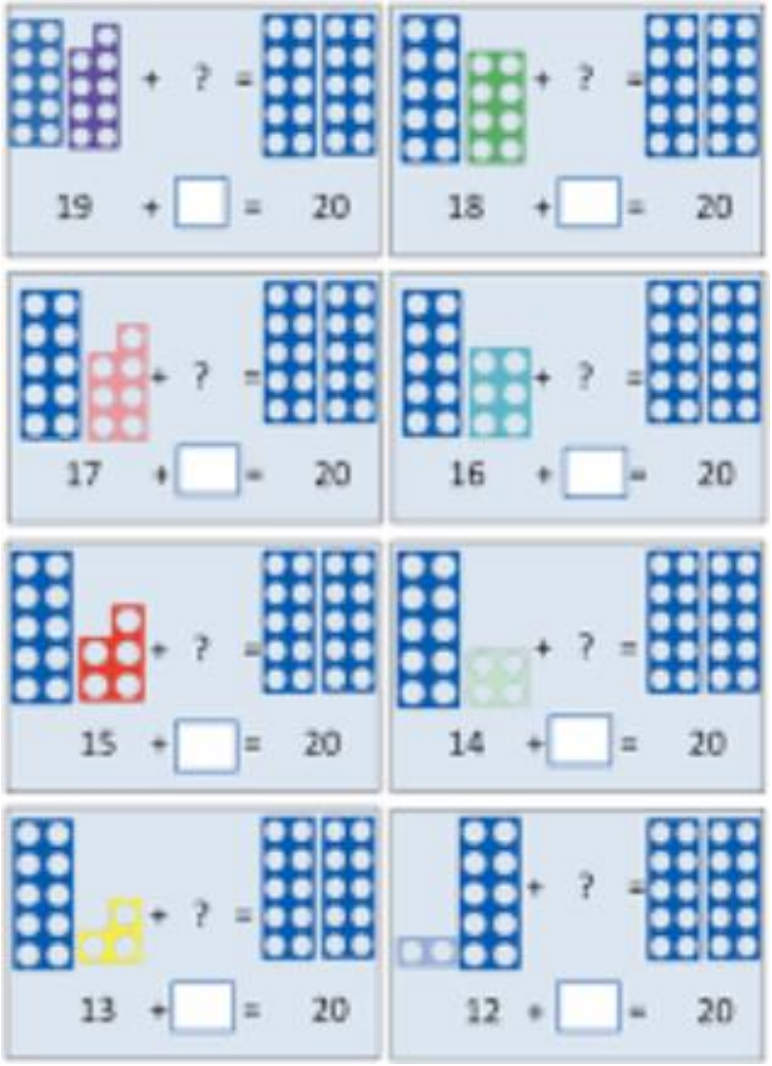




Bonds to 10 & 20







- This grid shows the number facts children should be secure on by the end of Year 1 and 2



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

a) What are the numbers?



19 ✓ 20 ✓



11 ✓

Write the numbers in order.
Start with the smallest number.

smallest 11 ✓ 19 ✓ greatest 20 ✓

I

b) What are the numbers?



30 12 12 ✗ 22

Write the numbers in order.
Start with the smallest number.

smallest 12 12 ✗ 22 greatest 30

I ✓

2 Write the numbers in order.
Start with the smallest number.

a) 36 31 32

smallest 31 32 ✓ greatest 36

I

3 Write the numbers in order.
Start with the greatest number.

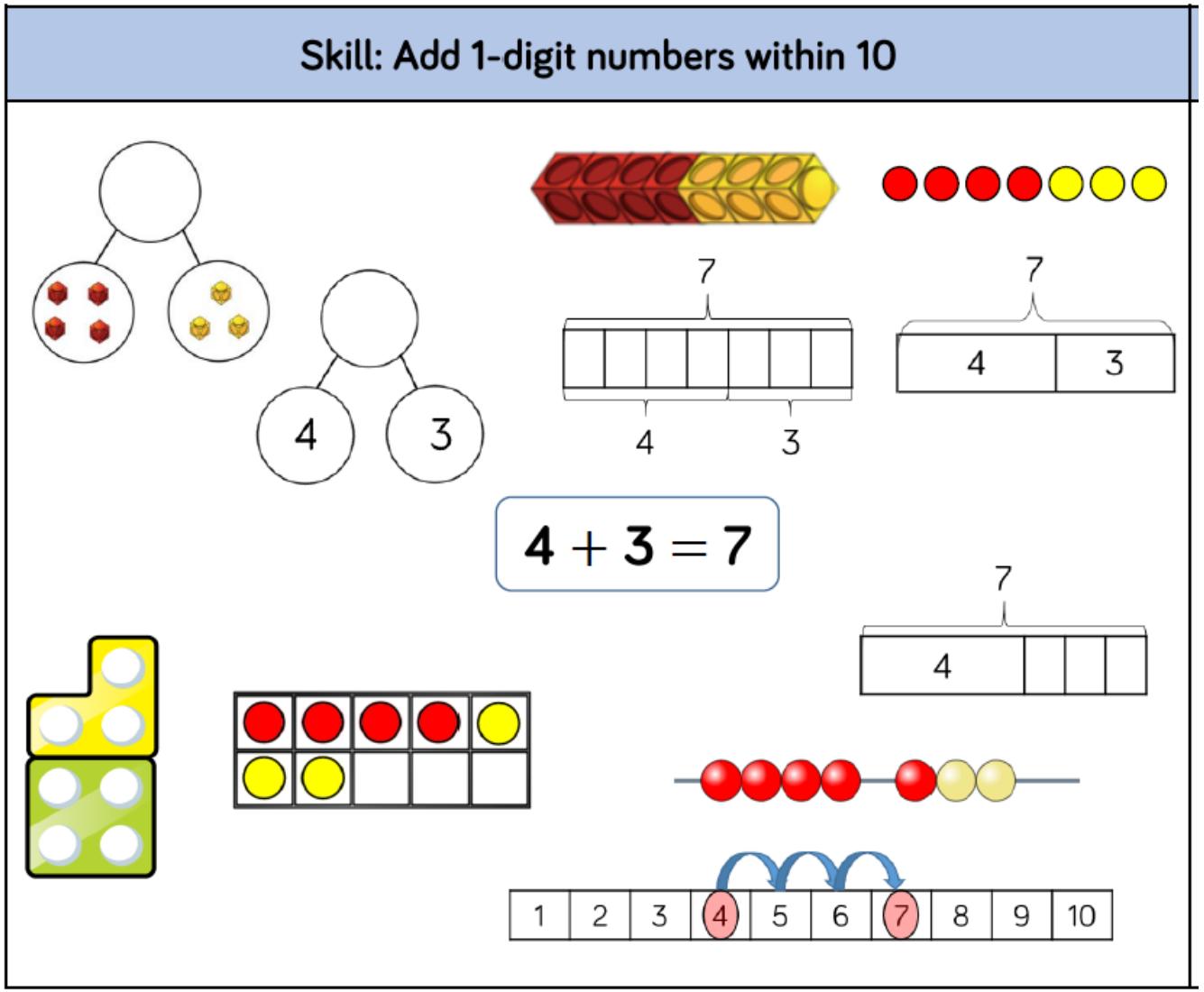
17 41 28

greatest ✗ 28 41 28 smallest 17

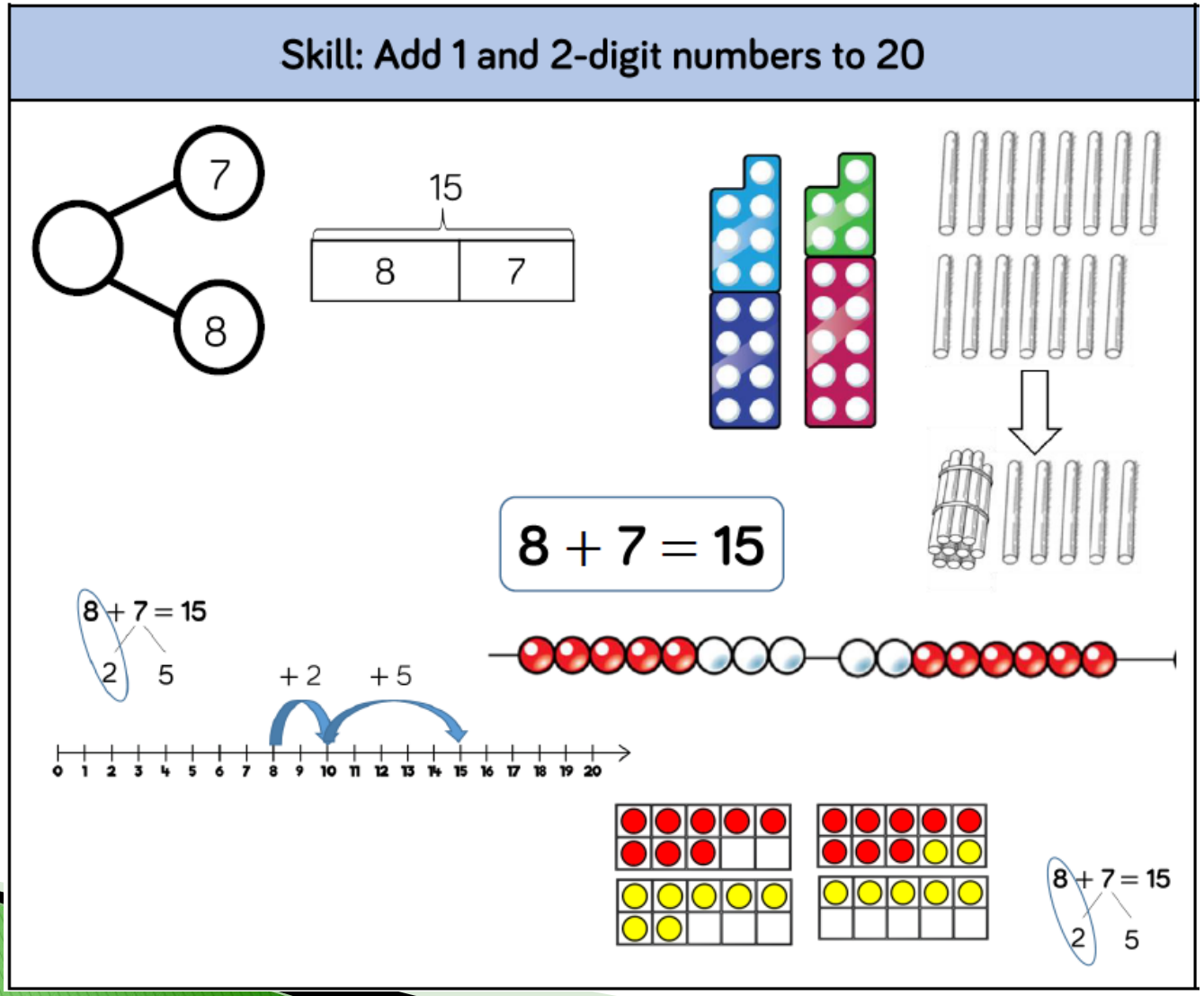
Look at the tens first.

✓NM 2:27 I

Calculation policy
Addition– Year 1

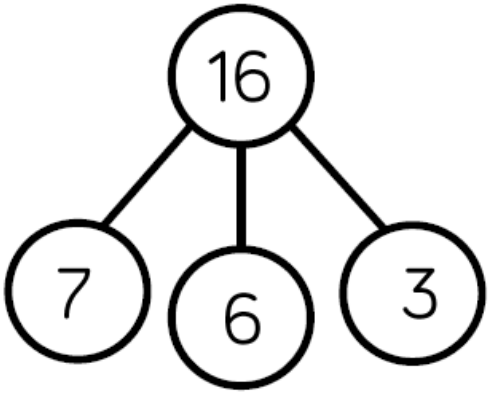


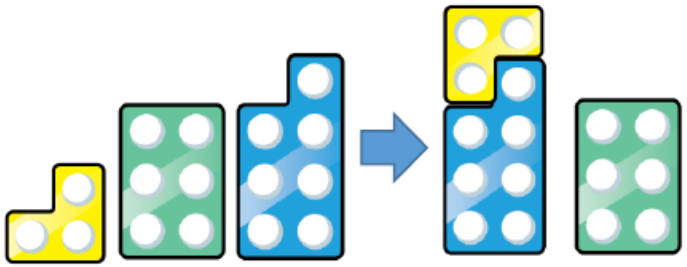
Calculation policy
Adition– Year1 /2



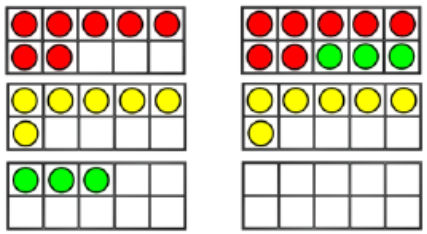
Calculation policy
Adition– Year2

Skill: Add three 1-digit numbers



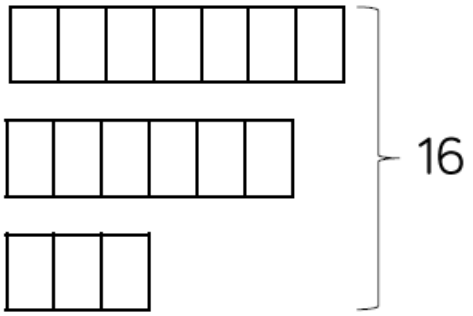


$7 + 6 + 3 = 16$



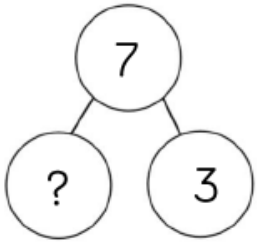
$7 + 6 + 3 = 16$

10

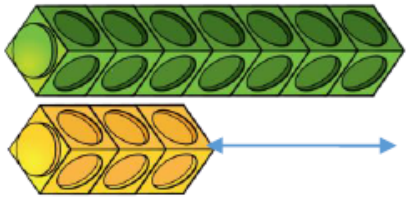


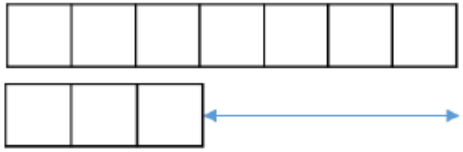
Calculation policy
Subtraction– Year1

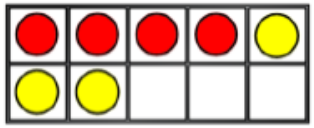
Skill: Subtract 1-digit numbers within 10



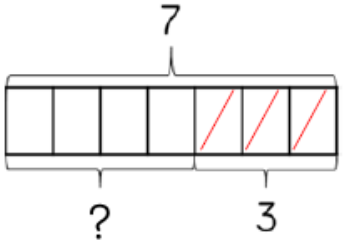


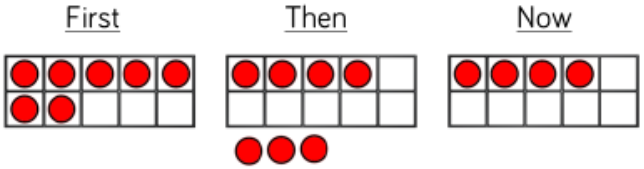


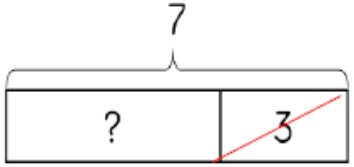




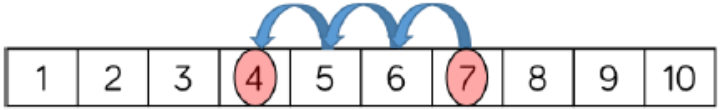
$7 - 3 = 4$



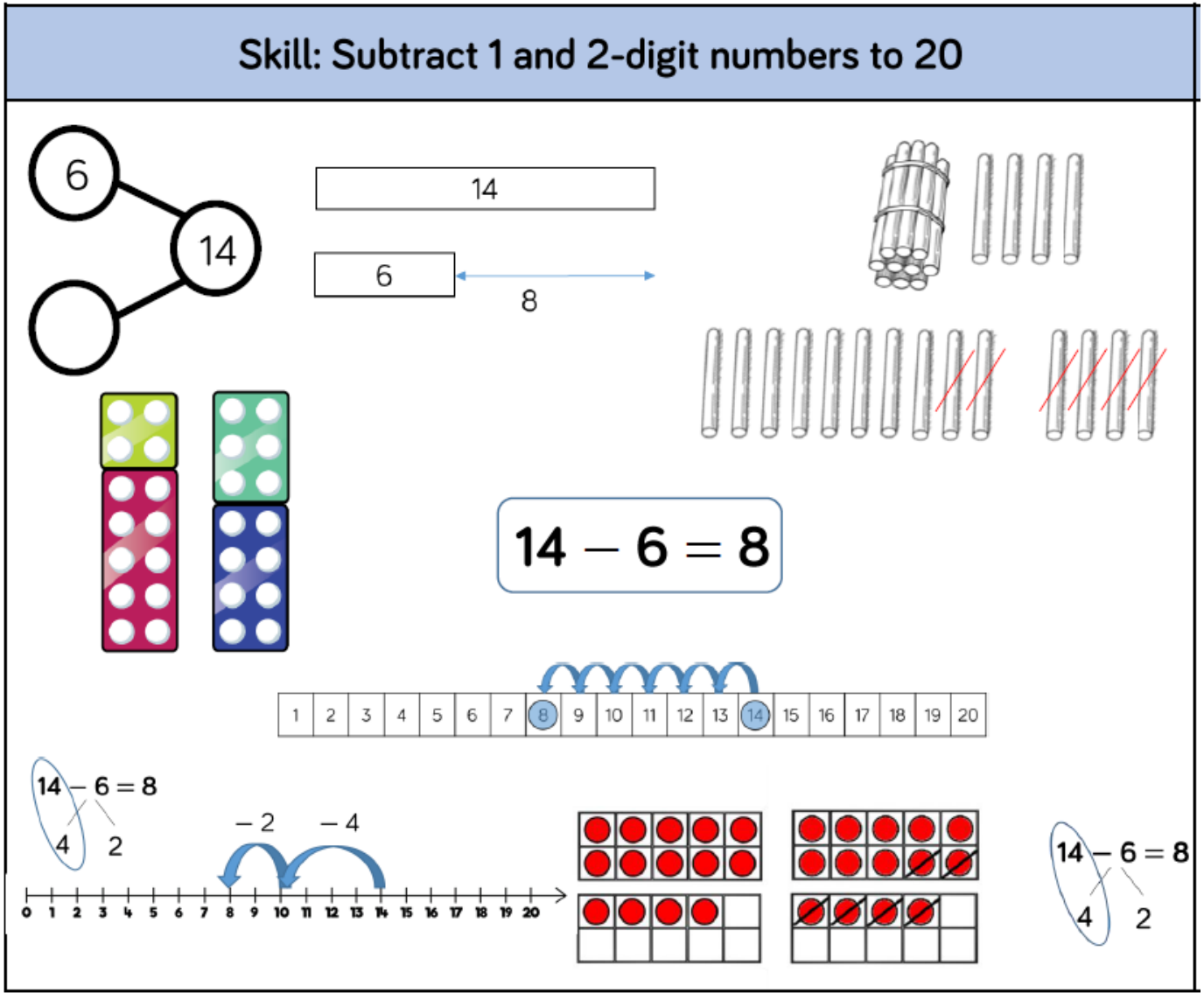






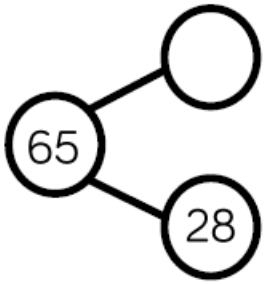


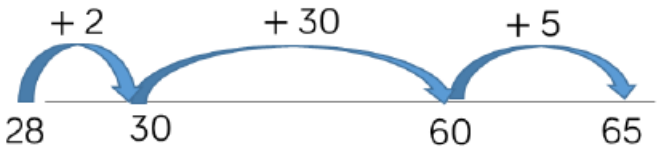
Calculation policy
Subtraction– Year1 /2

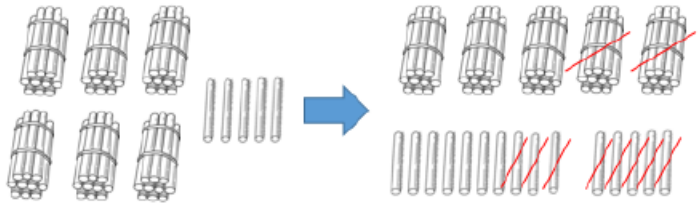


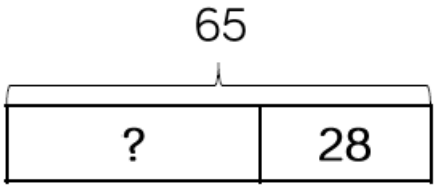
Calculation policy
Subtraction– Year2

Skill: Subtract 1 and 2-digit numbers to 100

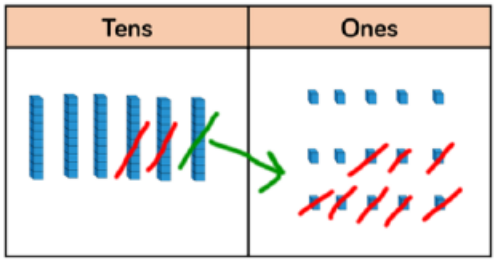




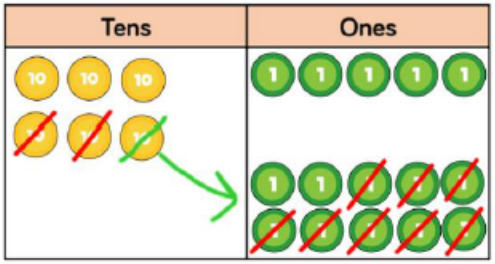




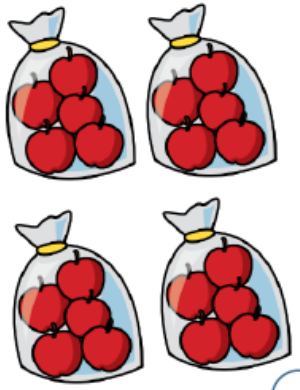
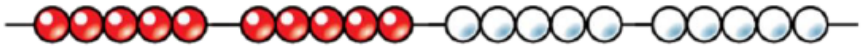
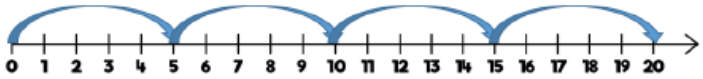
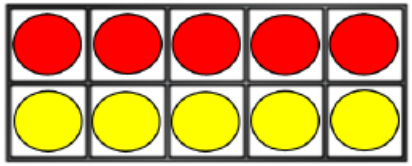
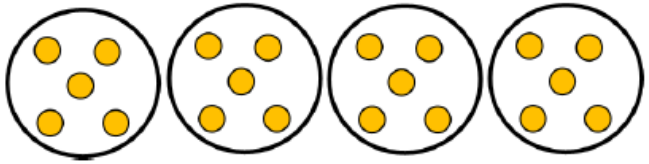
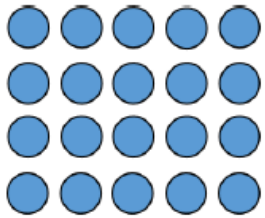
$65 - 28 = 37$



$$\begin{array}{r} {}^{5}\not{6}\,{}^{1}\not{5} \\ -\ 2\ 8 \\ \hline 3\ 7 \end{array}$$



Calculation policy
Multiplication

Skill: Solve 1-step problems using multiplication	Year: 1/2
    One bag holds 5 apples. How many apples do 4 bags hold?    $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$ $5 \times 4 = 20$	Children represent multiplication as repeated addition in many different ways. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally. In Year 2, children are introduced to the multiplication symbol.

How many apples are there altogether?



There are [10] apples on each ten frame.

There are [2] ten frames.

There are [20] apples altogether.

3 How many counters are there altogether?



There are [40] counters altogether.

4 Complete the number tracks.

10	20	30	40	50	60	10

70	60	50	40	30	20	10	0

5 Tom has these balloons.

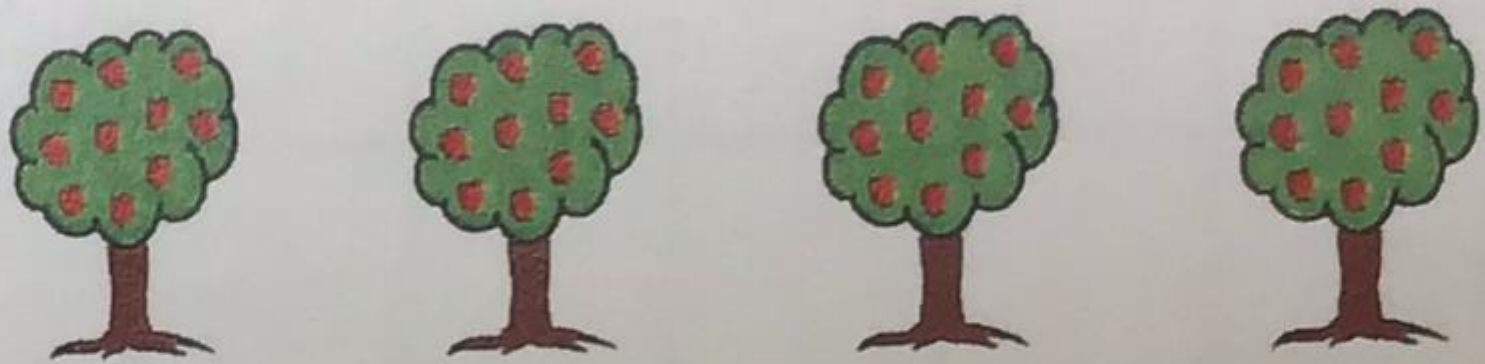


He needs 60 balloons for a party.

Does Tom have enough balloons?

How do you know? Yes because there are 6 bags of balloons

Excellent



There are 4 apples on each tree.

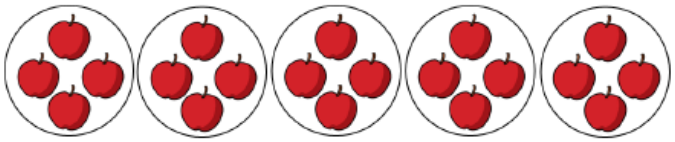
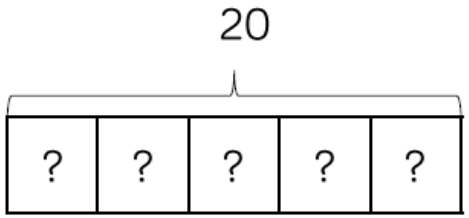
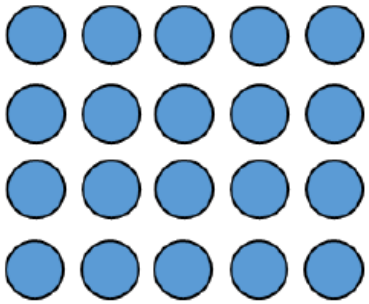
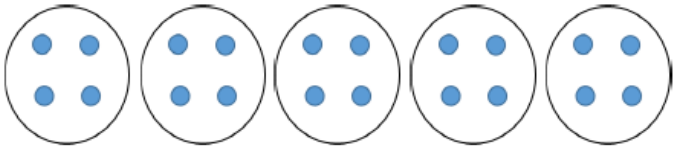
There are 10 trees.

There are 40 apples altogether.

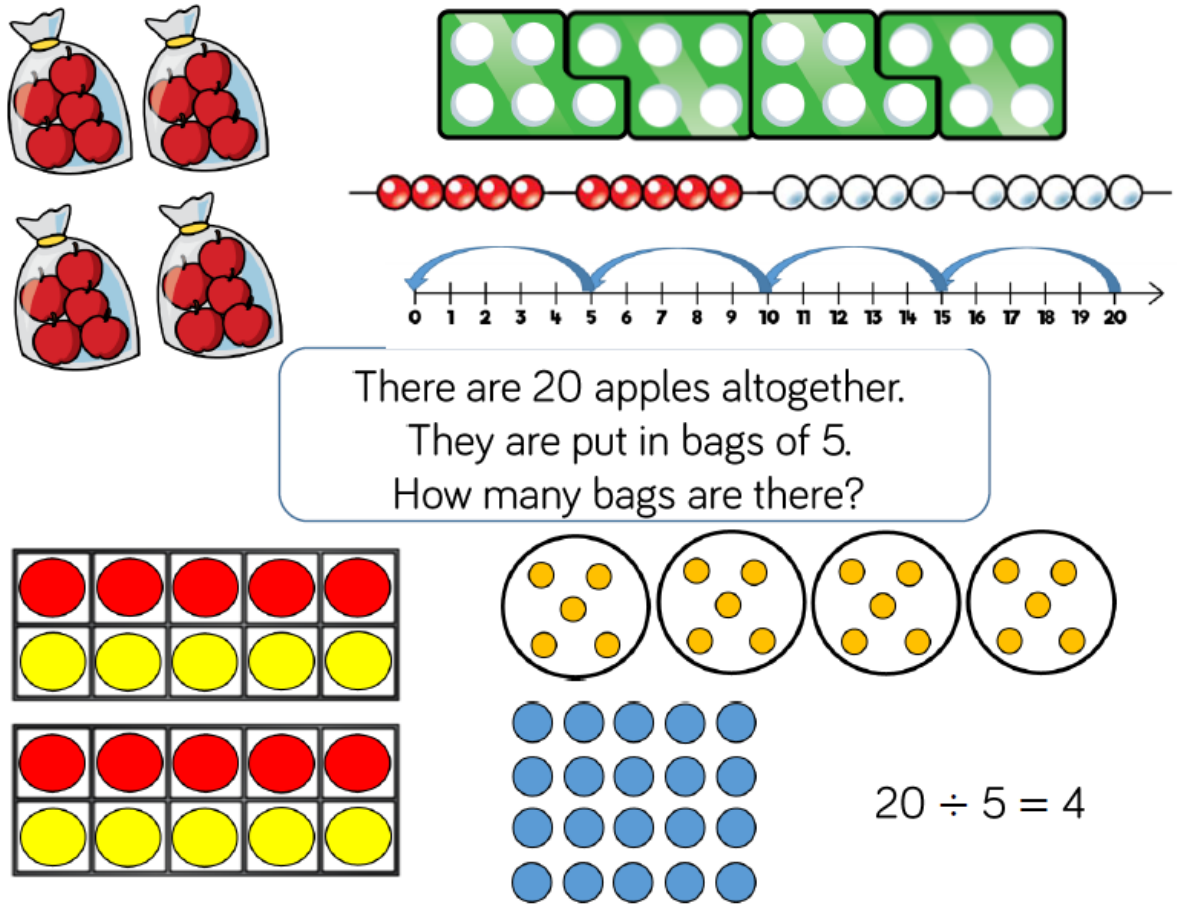
True or false?

Explain your answer. because
there are not ten

Calculation policy
Division

Skill: Solve 1-step problems using multiplication (sharing)	Year: 1/2
  There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?   20 ÷ 5 = 4	Children solve problems by sharing amounts into equal groups. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally. In Year 2, children are introduced to the division symbol.

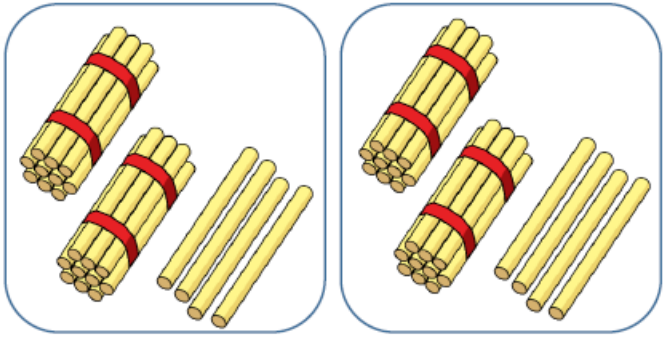
Calculation policy
Division

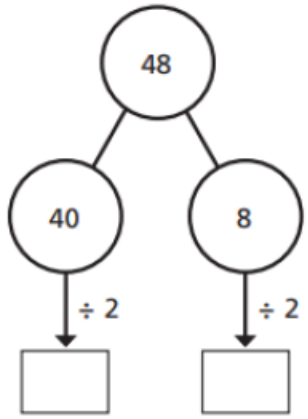
Skill: Solve 1-step problems using division (grouping)	Year: 1/2
	Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.

Calculation policy
Division

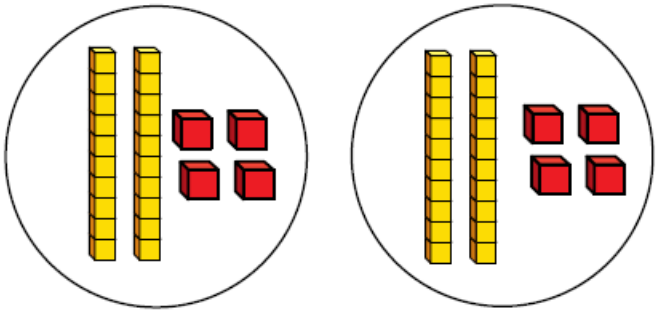
Skill: Divide 2-digits by 1-digit (sharing with no exchange)	Year: 1/2

Tens	Ones
10 10	1 1 1 1
10 10	1 1 1 1





$$48 \div 2 = 24$$



When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones.

Straws, Base 10 and place value counters can all be used to share numbers into equal groups.

Part-whole models can provide children with a clear written method that matches the concrete representation.

Make equal groups – grouping

White Rose Maths

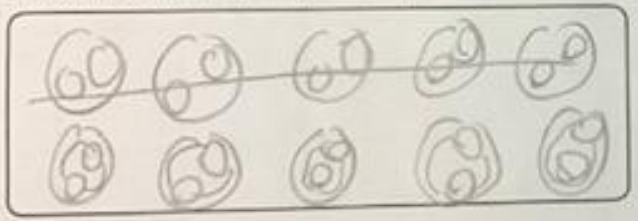
1 Annie has 10 apples.



Annie has some plates.

She wants to put 2 apples on each plate.

Show how Annie groups the apples.



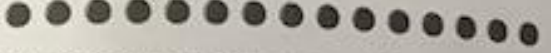
Complete the sentences.

There are [10] apples.

There are [2] apples on each plate.

There are [5] plates. ✓

2 Take 15 counters.



Put the counters into groups of 3

Complete the sentences.

There are 15 counters.

The counters are in groups of [3]

There are [5] groups. ✓

3 Mo has 20 chairs.

a) Circle groups of 5 chairs.



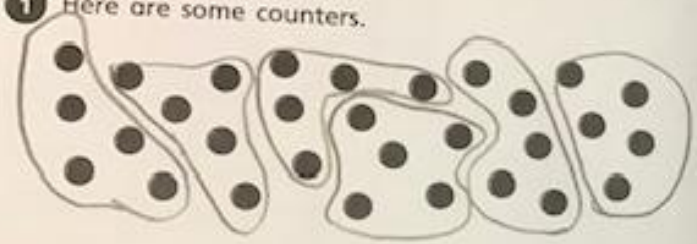
b) How many groups did you circle? [4]

c) Complete the number sentence.

[20] ÷ [4] = [5] ✓

Divide by 5

1 Here are some counters.



a) Draw circles around groups of 5

b) Complete the sentences.

There are 30 counters.

There are [5] counters in each group.

There are [6] groups.

30 ÷ 5 = [6]

[6] × 5 = 30

2 Share the sweets between the party bags.



There are [15] sweets.

There are [5] party bags.

There are [3] sweets in each bag.

15 ÷ [3] = [5]

3 Complete the number sentences for each array.

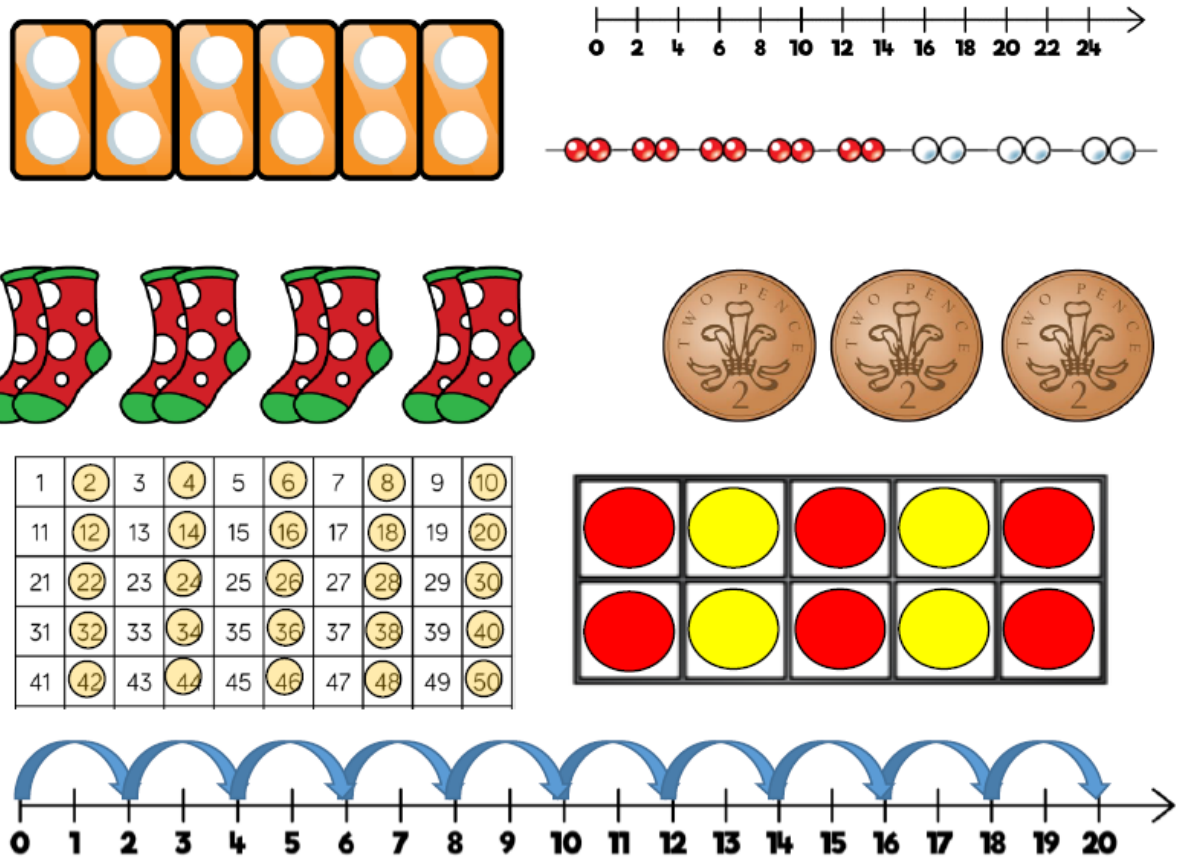
a)



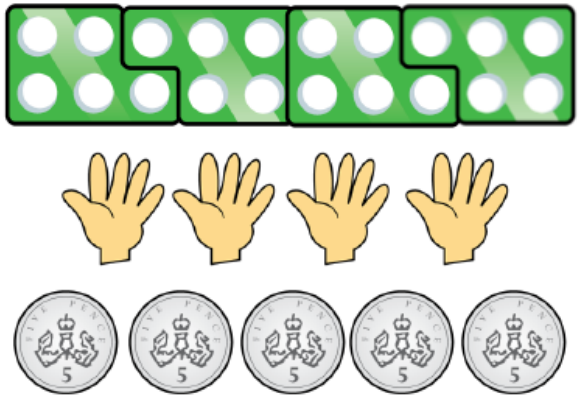
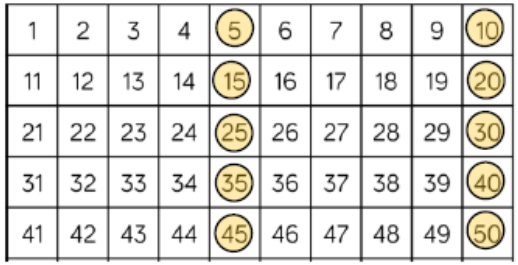
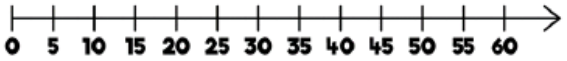
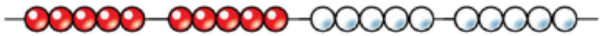
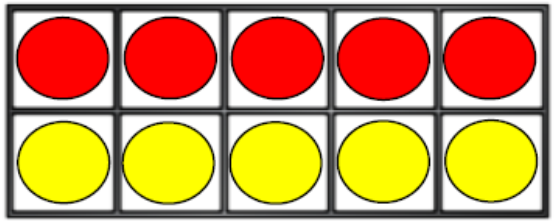
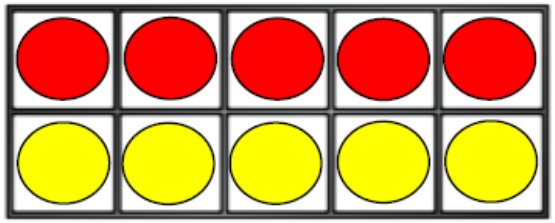
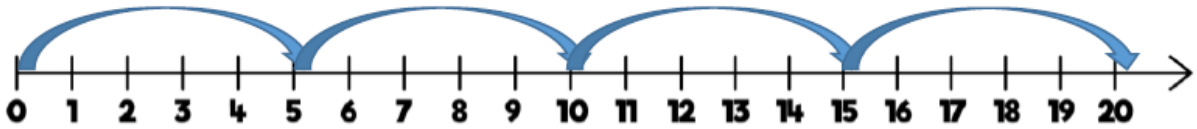
[4] × 5 = 20

20 ÷ 5 = [4]

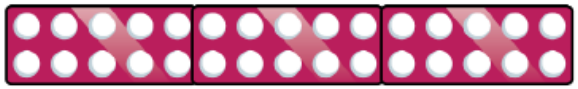
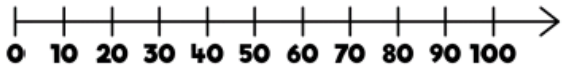
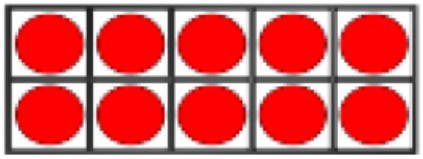
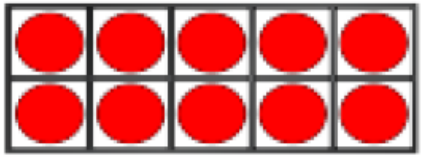
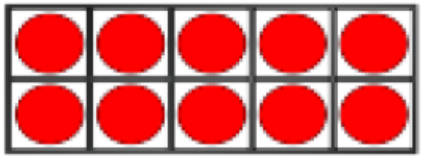
Times tables

Skill: 2 times table	Year: 2
	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the two times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones. Use different models to develop fluency.

Times tables

Skill: 5 times table	Year: 2
      	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern.

Times tables

Skill: 10 times table	Year: 2
      	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the ten times table, using concrete manipulatives to support. Notice the pattern in the digits- the ones are always 0, and the tens increase by 1 ten each time.

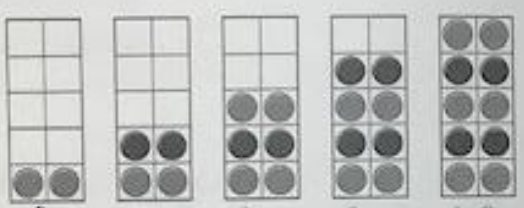
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Count in 2s

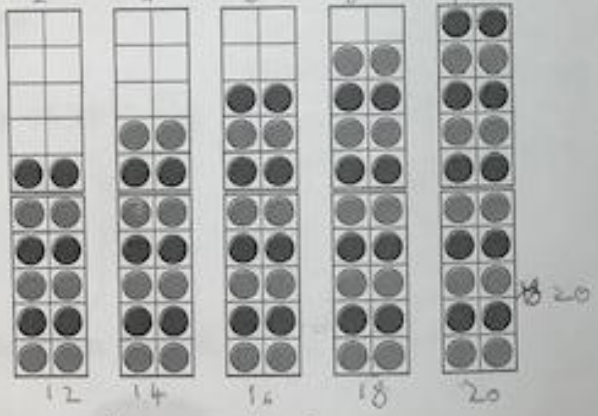
White Rose Maths

1 What are the numbers?

a)



b)



2 How many flowers are there?



3 Circle 14 socks.



4 Fill in the missing numbers.

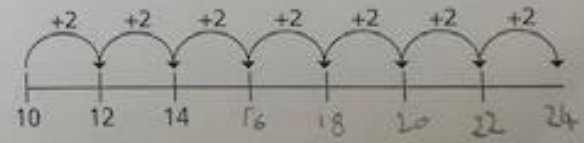
a)

0	2	4	6	8	10	12	14

b)

18	16	14	12	10	8	6	4

c)



5 How far can you count up in 2s?

Work with a partner.

Can you count up to 50 together?

Now try counting down in 2s from 50



Every number in the two times table is even.

Is Kat correct? Yes

Explain your answer.

Yes

Because 2 is a even numer and even add even equals even and the two times table's does adsuely that just again and again and again.

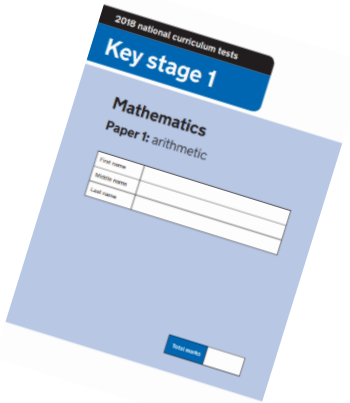
Che says that 9X2=11

Is Che correct? no

Explain your ~~Anser~~ Awnser it needs to be ~~se~~ even

End of KS1 SATs

- At the end of KS1 (Year 2) children will take their end of KS1 SATs
- This is done in school, with their class teachers
- The Maths SATs consist of an arithmetic paper and a reasoning paper
- The Arithmetic paper consists of 25 questions. Children will have 20 minutes to complete this although this is not strictly timed.
- The Reasoning paper consists of 35 questions which can be read out to the children. The children have 30 minutes to complete this, although this is not strictly timed.



How can you help your child at home

- https://whiterosemaths.com/parent-resources

- For number games, follow this link:
- https://www.ictgames.com/

- Support with practical and pictorial resources if they are not ready for abstract
- Practise, practise, practise! Little and often is best to embed in long term memory
- Involve them in real life context maths problem solving (shopping, baking etc)
- Remind them it is not about having the right answer but about persevering and using what they know
- Give them thinking time and allow them to use strategies that best help them
- Encourage reasoning- ask how they know and why they think something is/ isn't
- Be patient!

Thank you for attending.

Please have a look at the resources on table and explore you wish!

Any questions?