Year 2 Maths
Parent's workshop

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Every school has a Calculation policy where it shows you how each of the 4 operations will be taught across the school. Here is a brief overview of ours for Year 2 but I will show you some of these in much more detail.

ARTHUR BUGLER PRIMARY SCHOOL

Calculation Policy

A Mathematical Calculation Policy explaining how we teach the four operations of number.

+ - x ÷

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Calculation Policy Guidance

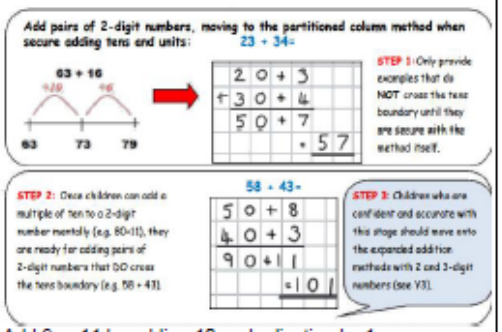
Year 2

Addition

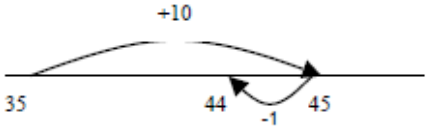
+ = signs and missing numbers

Continue using a range of equations as in Year 1 but with appropriate, larger numbers.

Extend to
14 + 5 = 10 + □
and adding three numbers
32 + □ + □ = 100 35 = 1 + □ + 5



Add 9 or 11 by adding 10 and adjusting by 1
35 + 9 = 44



Add numbers including:

- a two-digit number and 1s
- a two-digit number and 10s
- 2 two-digit numbers
- adding 3 one-digit numbers

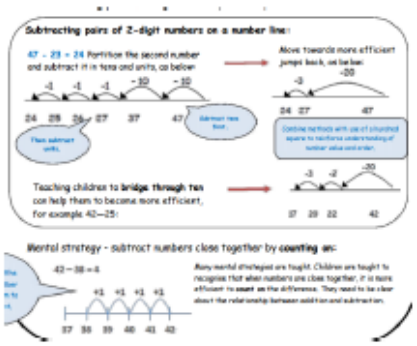
Show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot.

Recognise and use the inverse relationship between addition and subtraction and check calculations and solve missing number problems

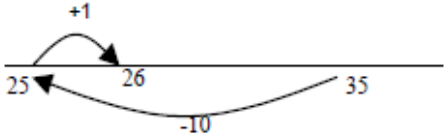
Subtraction

- = signs and missing numbers

Continue using a range of equations as in Year 1 but with appropriate numbers.
Extend to 14 + 5 = 20 - □



Subtract 9 or 11. Begin to add/subtract 19 or 21
35 – 9 = 26



Formal Written methods may be introduced for more able

No exchange

$$\begin{array}{r} 57 \\ -\ 23 \\ \hline 34 \end{array}$$

With exchange

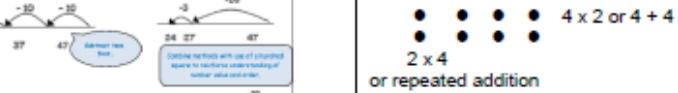
$$\begin{array}{r} 7\ 8^{1}4 \\ -\ 2\ 6 \\ \hline 5\ 8 \end{array}$$

Multiplication

x = signs and missing numbers

7 x 2 = □ □ = 2 x 7
7 x □ = 14 14 = □ x 7
□ x 2 = 14 14 = 2 x □
□ x ∇ = 14 14 = □ x ∇

Arrays and repeated addition



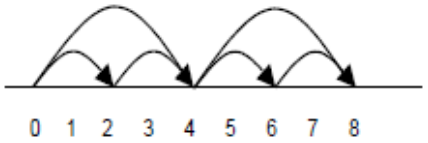
or repeated addition

2 + 2 + 2 + 2

Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs.

Show that multiplication of 2 numbers can be done in any order (commutative).

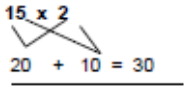
Solve problems involving multiplication using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.



Doubling multiples of 5 up to 50

15 x 2 = 30

Partition

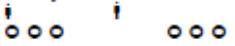


Division

÷ = signs and missing numbers

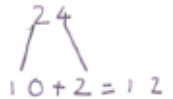
Solve problems involving division, using materials, repeated subtraction, mental methods, and division facts, including problems in contexts.

Understand division as sharing and grouping
6 ÷ 2 can be modelled as:
Sharing
6 sweets can be shared between 2 people, how many do they have each?



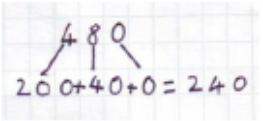
Grouping
There are 6 sweets, how many people can have 2 each? (How many 2's make 6)

Halving even numbers up to 100 eg



Half of 24 = 12

Recall and use division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers Children to complete through the school number bonds scheme and to begin the times tables scheme.



Informal jottings used and formal written methods may be introduced towards the end of Year 2 where appropriate

Divisibility rules – understanding that multiples of 2 are even numbers and multiples of 10 end in 0.

Calculate mathematical statements for division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs e.g. 6 ÷ 2 = □ □ = 6 ÷ 2
6 ÷ □ = 3 3 = 6 ÷ □

Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot.

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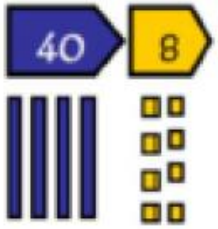
Addition

Concrete resources:

- 100 square
- Number lines
- Bead strings
- Straws
- Dienes
- Place value cards
- Place value dice
- Place value counters
- Numicon



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

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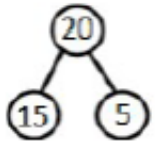
- Here at ABP we use the White Rose Hub as a resource and scheme to help the children understand and flourish within the Maths curriculum. They always learn with concrete materials first, then pictorially and then in an abstract way where they are required to use their knowledge and apply it to a new situation. We will have a look at some examples together.

- The teaching and expectations of Maths has dramatically changed since we all left school. Gone are the days where children are given worksheets and expected to do hundreds of 'sums'. Now it is all about understanding a concept then using and applying it in a variety of contexts.
- Addition and subtraction are intertwined with each other and are not taught as stand alone areas as such. If you know an addition sentence you know in fact 2 addition sentences and 2 take away number sentences. Let me demonstrate for you. We call these fact families.

Varied Fluency

1. Using concrete apparatus, can you talk about the relationships between the different flowers?

2. One relationship shown by this part whole model is
$15 + 5 = 20$
Can you write all associated fact facts in the sentences below?



3. Look at the bar model below. Can you write all of the sentences in the fact family?

- With the varied fluency section of the White Rose Hub, this is where the children show the learning that is already embedded from the previous year or the beginning of the unit of work.

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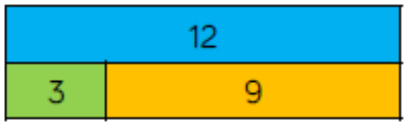
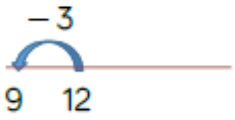
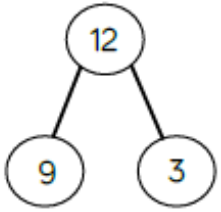
Fact Families

Reasoning and Problem Solving

Which of the representations are equivalent to the bar model?







$12 = 9 + 3$

There were 9 cars in the car park. 3 cars have left.

$9 - 3 = 12$

- Once the teacher is happy that the children know the basics, you can move forward with applying the skill pictorially.

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Varied Fluency

1. How can we use the following representation to prove $5 + 3 = 4 + 4$?

2. Fill in the missing symbols:

$6 + 4$	◯	$6 + 5$
$6 + 4$	◯	$3 + 6$
$11 - 4$	◯	$12 - 5$
$11 - 4$	◯	$12 - 4$

3. Fill in the missing numbers:

$5 + 3 = 6 + \square$

$5 + 3 = \square + 6 = 7 + \square$

$\square + 3 = \square + 4 = 5 + 5$

You could also do this for subtraction relationships.

- Each sub section builds upon the learning from the previous section. (I describe this to my children as learning being like climbing a staircase. Sometimes you need to stay on the same stair until you are really confident with that concept.) The next step is always a little harder as you can see here.

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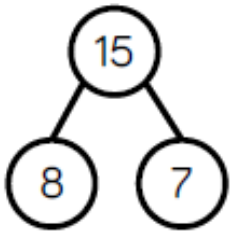
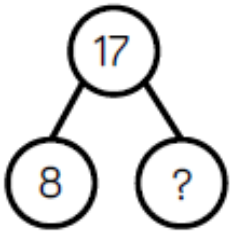
Compare Number Sentences

Reasoning and Problem Solving

Deb thinks she knows the missing number without calculating the answer.

Can you explain how this could be possible?





- As you can see again the children need to problem solve in order to show their understanding of the concept.
- Reasoning features very highly in the SATs papers and it is vital the children can articulate their understanding of a concept.

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Varied Fluency

1. 64 + 17 =

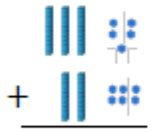
4 ones + 7 ones = ☐

6 tens + 1 ten = ☐

☐ tens + ☐ ones = ☐

$$\begin{array}{r} 64 \\ +\ 17 \\ \hline 11 \\ +\ 70 \\ \hline 81 \end{array}$$

2. Find the sum of 35 and 26



- Partition both the numbers.
- Add together the ones. Have we got 10 ones?
- Exchange 10 ones for 1 ten.
- How many ones do we have?
- Add together the tens. How many do we have altogether?

3. Class 3 has 37 pencils.
Class 4 has 43 pencils.

How many pencils do they have altogether?

- The learning continues to move on when adding 2, 2 digit numbers. First the children do this with concrete materials so they really understand the concept and then as we said before pictorially and then apply it in an abstract way.

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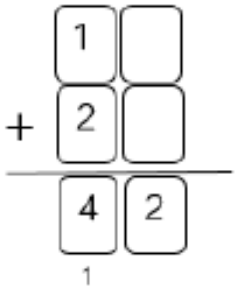
Add 2-digit Numbers (2)

Reasoning and Problem Solving

Find all the possible pairs of numbers that can complete the addition.



How do you know you have found all the pairs?

What is the same about all the pairs of numbers?

- Problems like this often come up in the SATs papers where they have to find all the possible combinations when solving a problem. We give the children lots of opportunities in class to try these types of questions.

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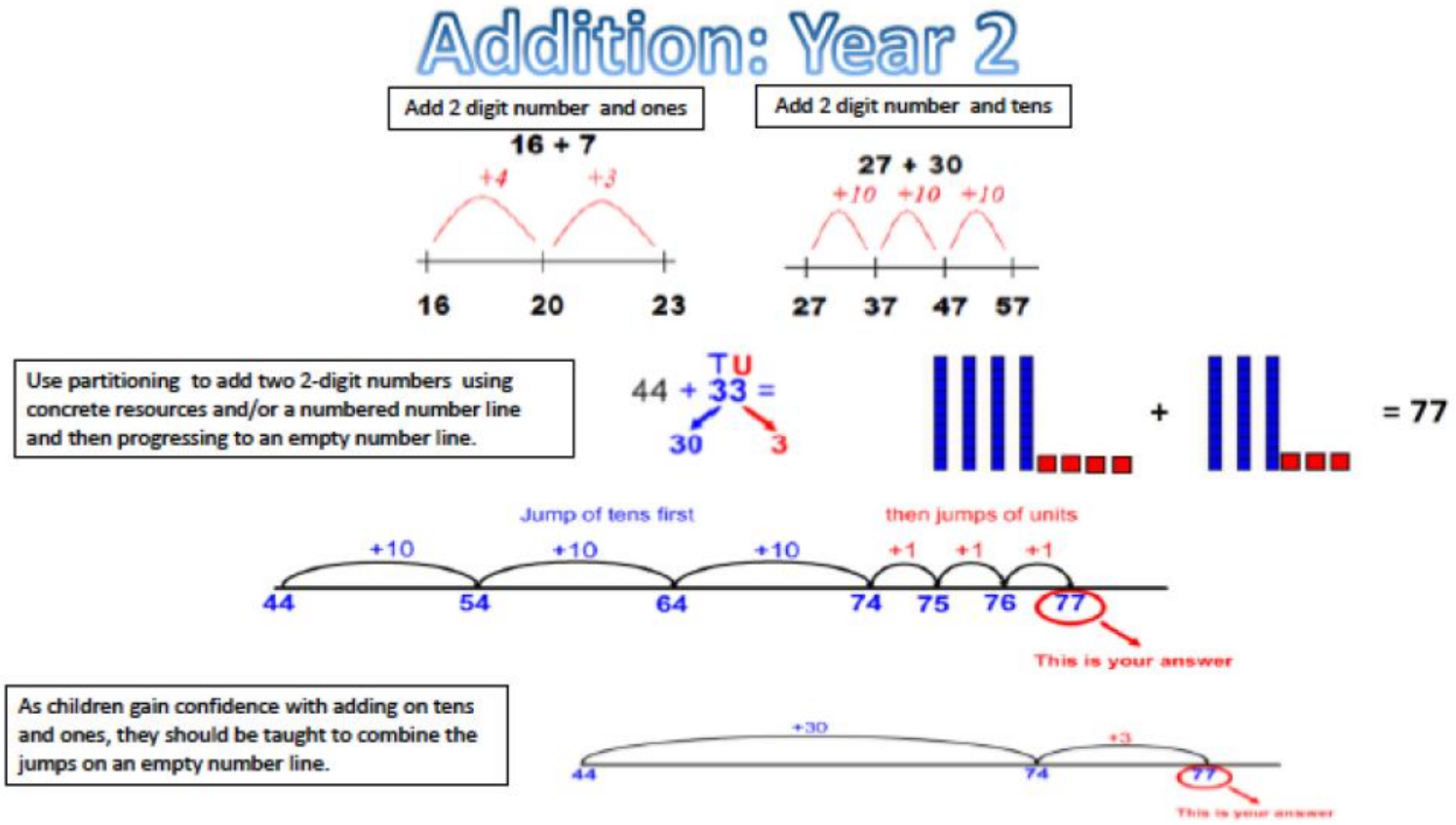
Here are some ways you may see addition recorded in your child's book.



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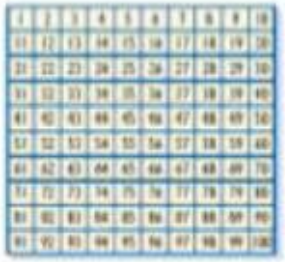
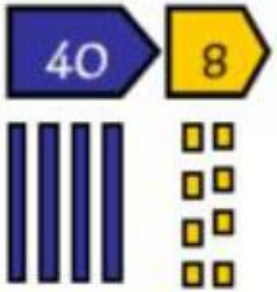
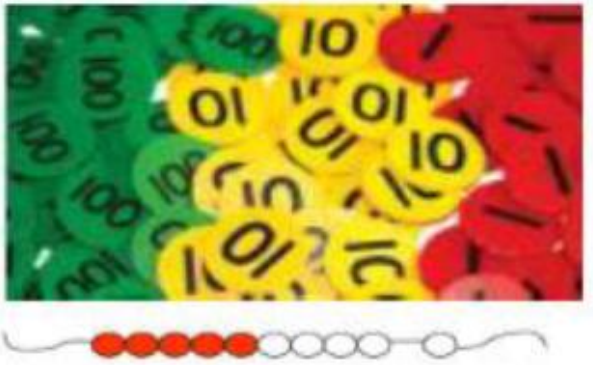
Subtraction

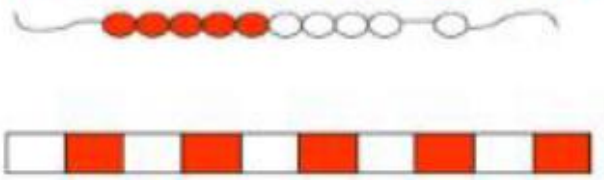
Concrete resources:

100 square
Number lines
Bead strings
Straws
Dienes
Counting stick
Place value dice
Place value cards
Place value counters









subtract
count on
count back
fewer
less
minus
take away
difference

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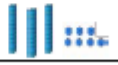
Varied Fluency

2 Continue the pattern

$22 = 29 - 7$
$22 = 28 - 6$

3 Using apparatus, complete the missing boxes.

10 less		10 more
		
2	12	22
		
	37	

- Once again it follows the same precedent as before. You need to ensure they understand a concept before moving on. As you can see here this is another example of how addition and subtraction are taught together.

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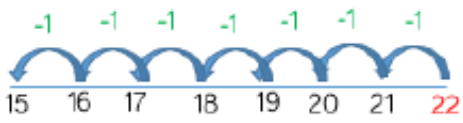
Varied Fluency

1 $22 - 7 =$

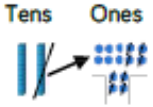


Can you put the larger number in your head and count back the smaller number? Start at 22 and count back 7

2 Can we use number bonds to subtract more efficiently?

We can partition 7 into 5 and 2 and use this to bridge the 10

3 Subtract 8 from 24



$$\begin{array}{r} {}^{1}\not{2}\,{}^{1}4 \\ -\quad 8 \\ \hline 1\ 6 \end{array}$$

- Can we take 8 ones away?
- Exchange one ten for ten ones.
- Take away 8 ones.
- Can you write this using the column method?

- Once the children have explored the concept using concrete materials they then begin to use more formal written methods such as these.

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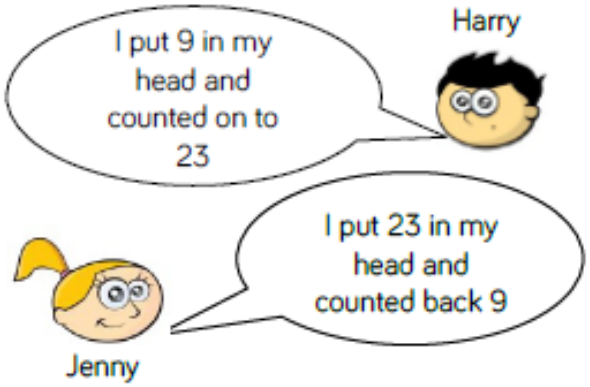
Subtract 1-digit from 2-digits

Reasoning and Problem Solving

Harry and Jenny are solving the subtraction 23 – 9

Here are their methods



Who's method is the most efficient?

Can you explain why?

Can you think of another method to solve the subtraction.

- Now we are back to reasoning and explaining how you know.

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Varied Fluency

1 Use the number line to subtract 12 from 51.

51

Can you subtract the ones first and then the tens?
Can you partition the ones to count back to the next ten and then subtract the tens?

2 42 − 15 =

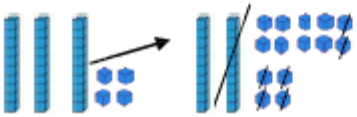
42
40 2
−10 −5

We can't subtract the ones. Can we partition differently?

42
30 12
−10 −5
20 7

Now we can subtract the ones and then subtract the tens.
42 − 15 = 27

3 Take 16 away from 34



$$\begin{array}{r} {}^{2}\not{3}\,{}^{1}4 \\ -\,1\;6 \\ \hline 1\;8 \end{array}$$

- When the learning is clearly embedded it again moves on to harder concepts.

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Subtract with 2-digits (2)

Reasoning and Problem Solving

Find the greatest whole number that can complete each number sentence below.

$45 - 17 > 14 + \square$

$26 + 15 < 60 - \square$

Explain your answer.

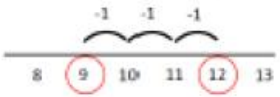
- Once again we move onto the reasoning and problem solving section of our learning.

Here are some ways you may see subtraction recorded in your child's book.

Subtraction: Year 2

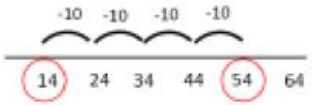
Subtract 2 digit and ones

12 – 3



Subtract 2 digit and tens

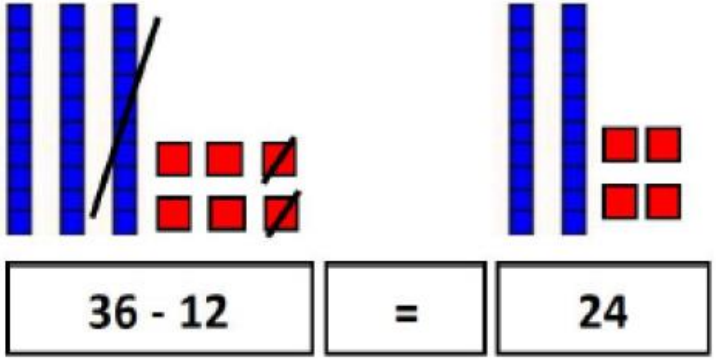
54 – 40



Use partitioning to subtract two 2-digit numbers using concrete resources and/or a numbered number line and then progressing to an empty number line.

36 - 12 = 24

10 2



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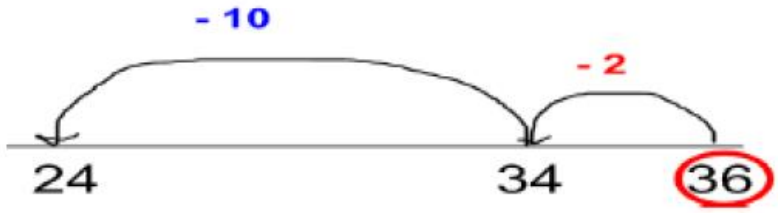

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How Can Parents Help?

- Be enthusiastic. Let your child see how excited you are about solving a problem.
- Provide time and talk about problem solving. Be patient with your child. Let them work at their own pace. Talk, talk, talk! Talk about options, strategies and ideas for problem solving.
- Reinforce risk taking. Children need a great deal of security to risk being wrong. When they begin to realize that they can learn from their mistakes, they will try harder to complete the problem.
- Reward perseverance. Instant success is not always possible in learning mathematics. Encourage children to keep trying by asking them questions that will lead them in the right direction.
- Use children's experiences. As often as possible, base problems on children's everyday experiences at school and at home.

The best way for your children to become good problem solvers is for them to solve problems, lots of problems! Also, it benefits children to think about how they solved the problem afterwards. In this way they may use their particular strategy to solve similar problems in the future. There are no best ways of solving a problem. We are interested in what makes sense to each individual. Here are some strategies to try with your child: ~ act it out ~ use objects or models ~ make a drawing ~ make a graph or chart ~ make a list ~ guess and check ~ sort and order items ~ look for a pattern ~ look for all possibilities ~ solve a simpler problem ~ choose an operation ~ think logically, use what you know.

Good websites to use at home

- https://mathseeds.co.uk/
- https://www.topmarks.co.uk
- https://www.oxfordowl.co.uk/for-home/kids-activities/fun-maths-games-and-activities/
- https://gb.education.com/games/first-grade/math/
- http://www.bbc.co.uk/schools/websites/4_11/site/numeracy.shtml
- https://nrich.maths.org/9412

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