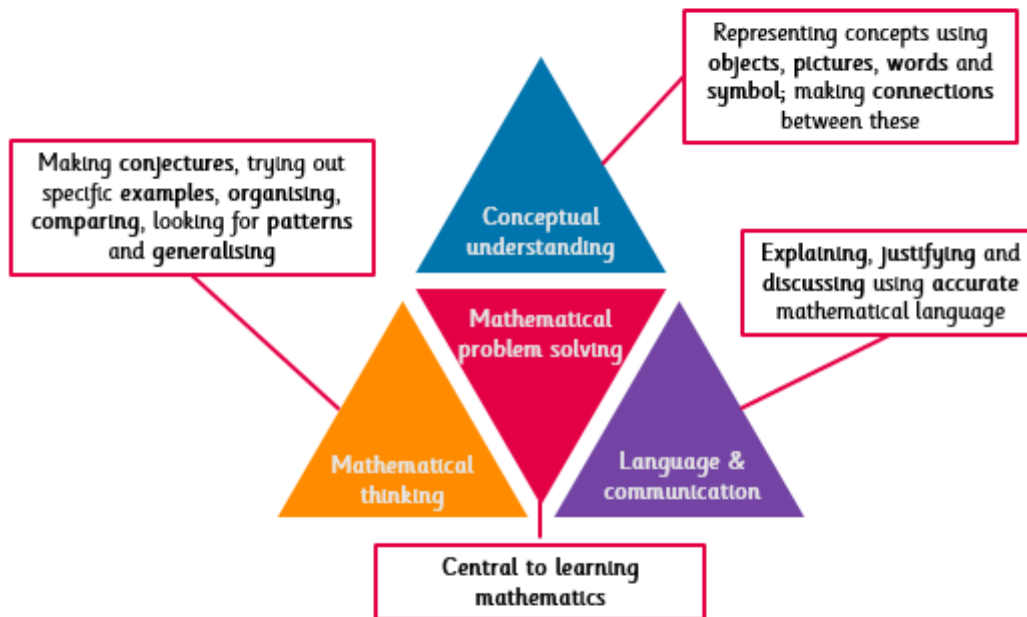


Year 1 handout – Autumn 2020

Mathematics Mastery

What is 'Mastery'?

The 'mastery approach' to teaching mathematics is the underlying principle of Mathematics Mastery. Instead of learning mathematical procedures by rote, we want your child to build a deep understanding of concepts which will enable them to apply their learning in different situations. To achieve this we aim to develop pupils' **Conceptual Understanding**, **Mathematical Thinking** and **Language and Communication**. (See diagram below).



Success for all

At school we believe all pupils can achieve success in maths. We encourage pupils to have a 'growth mindset' – a belief that effort leads to success and that challenges are opportunities to learn.

Here are a few tips to encourage your children at home with maths:

- ✓ Talk to your child about everyday maths
- ✓ Play games with them
- ✓ Value mistakes as learning opportunities
- ✓ Recognise that there is more than one way to work things out.
- ✓ Praise your child for effort over outcome.
- ✓ Avoid saying things like "I'm useless at maths".

Year 1 Autumn Curriculum Map

Year 1

Autumn Term

Numbers to 10	Addition and subtraction within 10	Shape and patterns
<ul style="list-style-type: none">• Represent, compare and explore numbers within 10• One more and one less• Doubling and halving	<ul style="list-style-type: none">• Represent and explain addition and subtraction• Commutativity• Addition and subtraction facts	<ul style="list-style-type: none">• Identify, describe, sort and classify 2-D and 3-D shapes• Investigate repeating patterns• Use and follow instructional and positional language

Numbers to 20	Addition and subtraction within 20
<ul style="list-style-type: none">• Identify, represent, compare and order numbers to 20• Doubling and halving• One more and one less	<ul style="list-style-type: none">• Represent and explain addition and subtraction strategies including 'Make Ten'• Use known facts to add and subtract

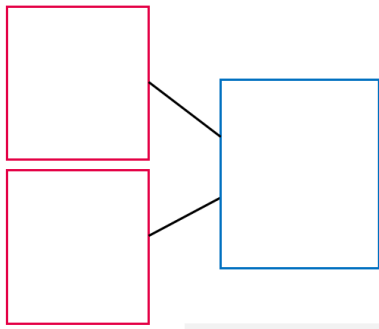
The rest of this handout will focus on addition and subtraction as this a big focus for us this term and learning from these units will be used and applied throughout the remainder of the year.

In Year 1, pupils are required to represent and use number bonds within 20. Mathematics Mastery is a cumulative curriculum meaning that learning is built over time, with new learning that makes connections to prior learning.

Pupils begin by using strategies to calculate number facts to ten. They use a combining strategy for an addition and a partitioning strategy for subtractions. We will be looking at both of these in more depth. Later in the term they use this learning to derive facts to 20.

By the end of the year pupils should be able to recall the number bonds to 10 but it is also important they have a deep understanding of why those facts are correct and how they relate to the real world. This is why clear visual representations are used when we introduce the facts.

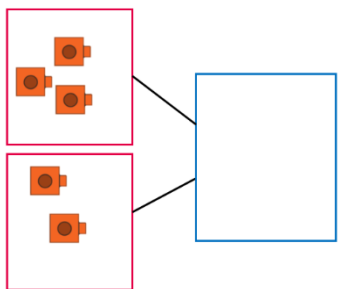
Part part whole model - addition



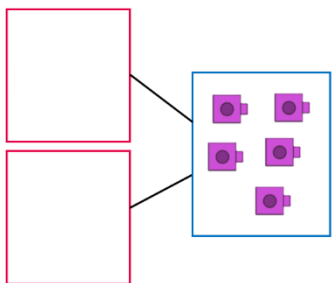
Pupils will be familiar with the part whole model shown and the language of parts and whole. The red boxes are the parts and the blue box is the whole.

The part whole model supports pupils' understanding of the structure of addition and subtraction. When we first begin using the part whole model we use concrete objects such as cubes to show pupils the process of addition and subtraction so that they can see how the amount changes. In year 1 pupils will use these alongside equations and make connections between the two, understanding the position of the parts and whole.

For example,



The parts are three and two. My first part is 3. My second part is 2.



If I bring these together, my whole is 5.

$$\boxed{3} + \boxed{2} = \boxed{5}$$

From this we can complete our number equations.

$$\boxed{5} = \boxed{3} + \boxed{2}$$

'Number equation' may also be known as a sum or sentence, but within our scheme, we used the term 'number equation'. (e.g. $3+2=7$, $8-2=6$)

The pupils will move on from counting all to counting on (counting on from 4 to 9) and model this. The language is really important when calculating to support their understanding. It is also important to emphasise that the is equal to sign is not always at the end of the equation.

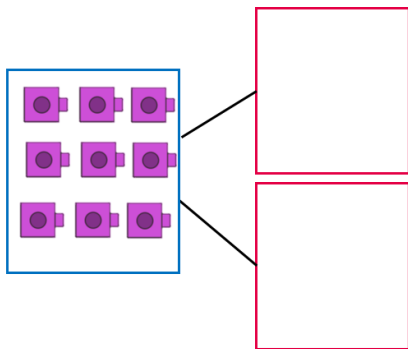
Part part whole model – subtraction

With subtraction we start with the whole and we partition the whole into two parts.

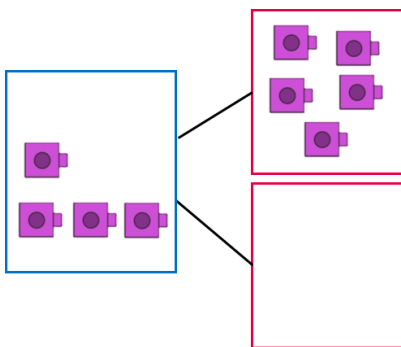
Definition of partitioning: A way of breaking a number into at least two parts resulting in a number bond for that number, for example, 12 is equal to ten and two.

The part part whole model can be used flexibly, the parts do not always need to be in the same position and sometimes we use more than 2 parts. These can be drawn at home too rather than needing a template.

For example, $9-5=4$



First count out 9 cubes. The whole is 9.



Now move five of those to one of the parts. One part is 5.

Now count out what's left – 4. There are four left over. The other part is 4.

Nine subtract five is equal to four.

Star words

equation subtract

minus partition

count back number line

$$\boxed{9} - \boxed{5} = \boxed{4}$$

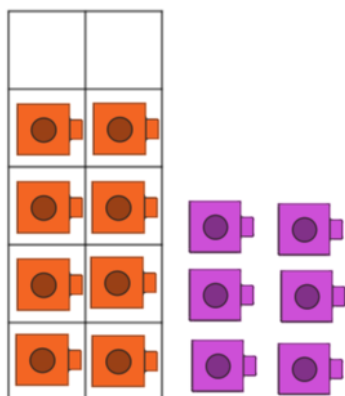
$$\boxed{4} = \boxed{9} - \boxed{5}$$

Now we can complete the number equation.

Making 10 strategy

When adding numbers that will result in a whole greater than ten, pupils use the make ten strategy. This is explored in Year 1 and developed in Year 2. As adults, it is something that most of us do “in our head” but it is important that it is taught step by step, initially with manipulatives, so that pupils are all able to understand this strategy and can apply it to problems later in Key Stage one.

For example,



Our first part is 8. I know that 8 and 2 make ten.

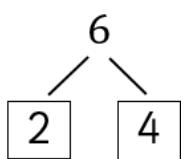
Star words

Make ten strategy

add is equal to

partition number bond

We need to partition the 6. My first part is two. My second part is four.



We now have ten and four which is equal to 14.

$$8 + 6 = \boxed{14}$$

Pupils will practise this using concrete manipulatives. This will help them visualise when doing similar strategies mentally later in key stage one.

This strategy can also be used for subtraction, for example $14 - 5$. We would first take away four then one.

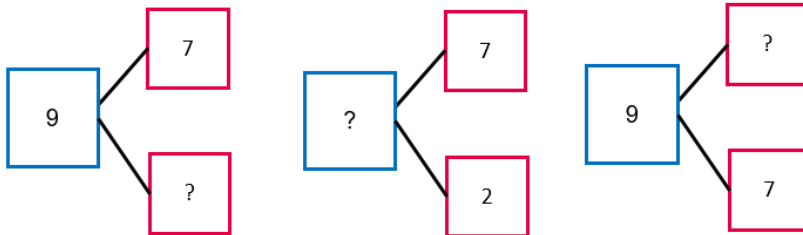
Number bonds

Number bonds are key!

Year 1

Autumn Term

- By the end of Year 1 all pupils should:
“represent and use number bonds and related subtraction facts within 20”



- By the end of Year 1 pupils should be able to memorise their number bonds to ten and ideally within 10 and use these facts to begin exploring all facts within twenty. (This is a process built upon over time and by the end of Year 2 they should be able to recall all facts within 20 fluently.)
- When practising at home ensure pupils begin with number bonds within ten and are really secure in these before moving on to number bonds within 20.
- Encourage pupils to make connections between number facts. E.g. $9 - 7 = 2$ and $9 = 2 + 7$, making fact families.
- The part whole model can be used to support their understanding, rather than just “memorising facts”.
- Practise at home should be verbal and fun!

Try this at home – workshop games

Adding circles

For this game, you need dice, a pencil and paper.

- Each of you should draw four circles on your piece of paper.
- Write a different number between 2 and 12 in each circle.



- Roll two dice. (Or roll twice, if you only have one die). Add the two numbers.
- If the total is one of the numbers in your circles then you may cross it out.
- The first person to cross out all four circles wins.

Part Whole Add Is equal
to

Grab bag Subtraction

Choose a number of things to work with, and put that many objects into a bag.

- You can use crayons, coins, beans, buttons, etc.
- Grab a handful of the items and count them. Ask your partner how many items are now left. *"I started with ___ items. I've taken out ___. How many are left?"*
- Write down the calculation.
- Encourage counting up or back, use manipulatives e.g. counters if you need to.
- You get a point for getting each calculation correct.
- Let your partner have a turn.

Part Whole Subtract Is equal to
Partition



Try this at home – more ideas

Make your own bead string

Try using dried pasta and string to make a 0-10 or 0 - 20 bead string. You can paint or dye the pasta different colours to expose different mathematical concepts. E.g. coloured groups of 2, 5 or 10.



Fact of the day/week

Have a 'fact of the day', e.g. $15 = 7 + 8$. Pin this fact up around the house. Practise reading it in a quiet, loud, or squeaky voice. Ask your child over the day if they can recall the fact

Ladybird cookies

Use red and black icing to decorate biscuits like lady birds. Put one line down the middle and decorate the biscuits with chocolate buttons or chocolate chips on each side. Explore different number bonds. For example how many ways can we arrange the spots to make seven?



Dice games

Playing with dice can be a great way to support your children with number bonds. If you don't have a pair of dice, try these online dice:

<https://www.random.org/dice/?num=2>

Songs

Try singing this song with the actions to learn the number bonds to 10:

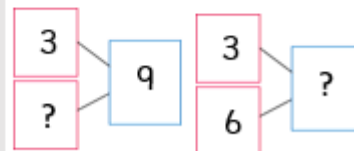
<https://www.bbc.co.uk/teach/supermovers/ks1-maths-number-bonds-with-martin-dougan/zfbcpq8>

Daily practice: number bonds

Challenge your children with missing number problems verbally.

Example

"The whole is 9. One part is 3. What is the missing part?"
Or, "I think of a number, I subtract 3 and I am left with 6, what was my number?"



Questions to support thinking

- What do you think would happen if....
- What's the same? What's different?
- How do you know that?
- Can you see a pattern? What would come next?
- What else could go in this set? What couldn't?