Holy Trinity
Lower School Maths Workshop

Miss Lomax

Mrs Caunce

Our purpose today is to:

- Positive mindset.
- Understand what is meant by 'mastery' in mathematics.
- Allow you to explore the materials.
- Explain and demonstrate how mathematics is taught in Lower School at Holy Trinity.
- Identify how fluency impacts on achieving mastery.
- Increase confidence and understanding in supporting your child at home.
- Give you the opportunity to ask questions

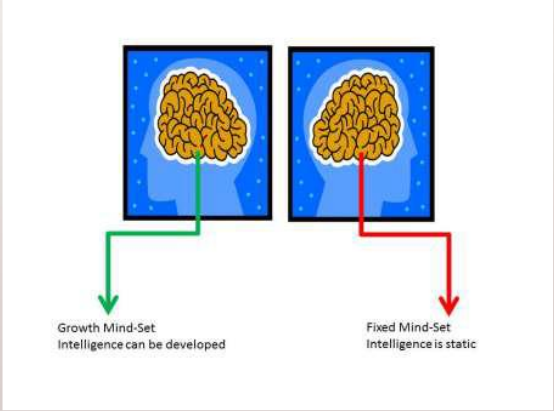
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Discuss 3 positive and negative experiences of Maths you had when you were a child.



If children hear 'I can't do maths' from parents, teachers, friends they begin to believe it isn't important.

People become less embarrassed about maths skills as it is acceptable to be 'rubbish at maths'



Fixed vs Growth mindset
Carol Dweck

- We believe that **everyone** can get better at maths…when they put in the **effort** and work at it.
- Do not praise children for being clever when they succeed at something, but instead should praise them for working hard.
- Children learn to associate achievement with effort (which is something they can influence themselves – by working hard!), not 'cleverness' (a traitperceived as absolute and that they cannot change).

The Mastery Approach

*Focus on children learning to **'reason mathematically, solve problems and develop mathematical fluency'***
These are the key aims of the Mastery Curriculum.

*…(Mastery) is about **deep**, secure **learning for all**, with extension of able students (more things on the same topic) rather than acceleration (rapidly moving on to new content).*

Final Commission on the Commission on Assessment without Levels

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What does it mean to master something?

- *I know how to do it.*
- *It becomes automatic and I don't need to think about it e.g. driving.*
- *I'm really good at doing it, painting a room or a picture.*
- *I can show someone else how to do it.*

What is mastery in Maths?

"In mathematics, you know you've mastered something when you can apply it to a totally new problem in an unfamiliar situation."

Dr. Helen Drury, Director of Mathematics Mastery

Mastery of Mathematics is More…

- Achievable for all.
- **Deep** and sustainable learning.
- The ability to build on something that has already been sufficiently mastered.
- The ability to **reason** about a concept and make connections.
- Conceptual and procedural **fluency**.

What do we mean by depth?

Learning is deeper NOT higher!



Advantages:

- Embedded learning:
- Slower and richer pace.
- Not lead by the clock.
- Reasoning focus.
- Mathematically makes more sense.

Mastery Maths

Children will be challenged to explain their thinking from the start. This is a key part of any lesson and mathematical language is at the heart of the mastery curriculum.



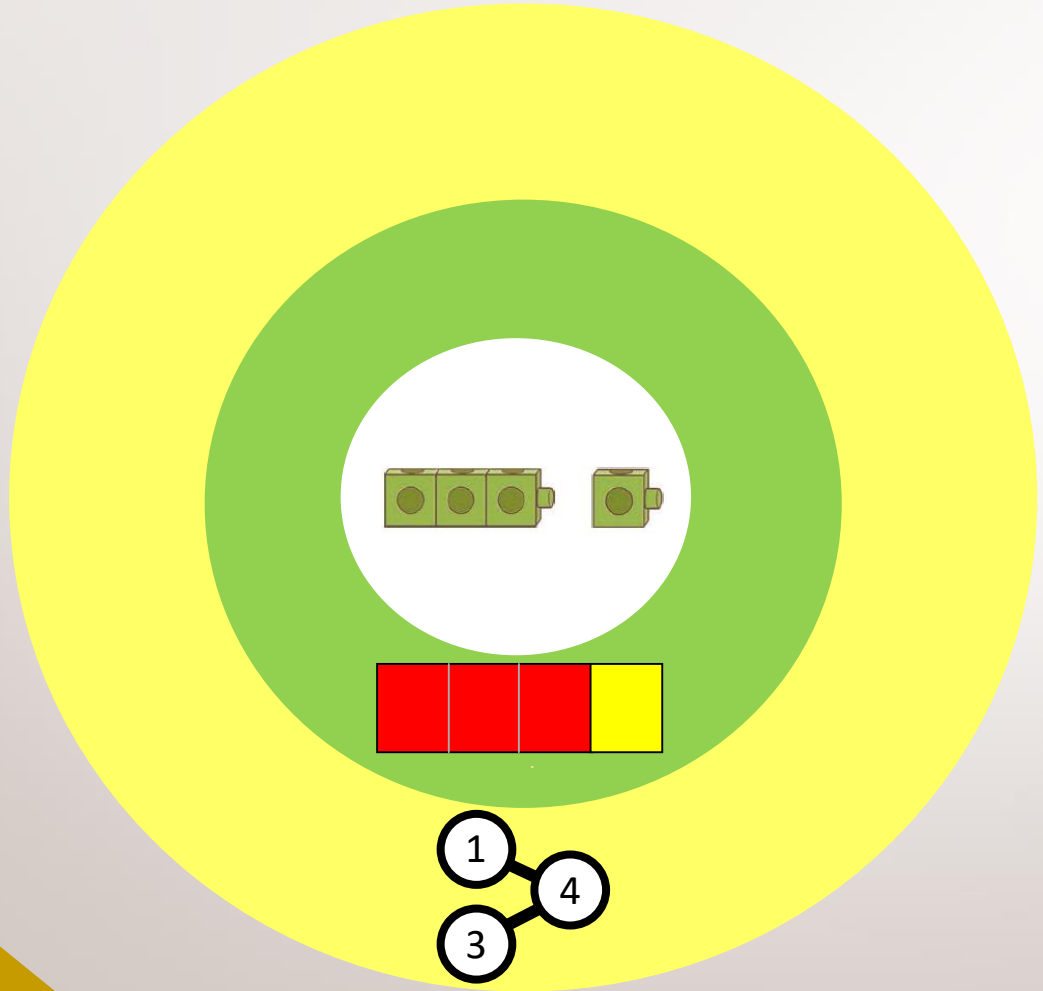
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Models and Images

Concrete – Pictorial – Abstract

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The CPA approach



Concrete:

resources such as cubes, counters and shapes

Pictorial:

pictures, drawings

Abstract:

numbers and symbols

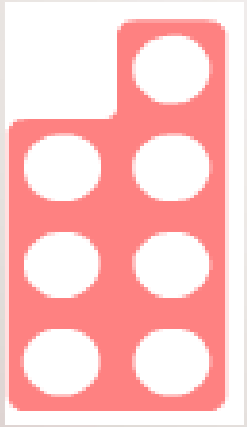
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The beginning

Knowing everything there is to know about a number.

Show me 7 – use the resources you have.

What do you know about 7?



It is an odd number.

It is a quarter of 28.

It is made up of a 3 and a 4.

It is two more than 5.

It is made up of a 3 twos and a one.

It is half of 14.

It is three fewer than 10.

It is a single digit number.

It is double three and a half.

It is a prime number.

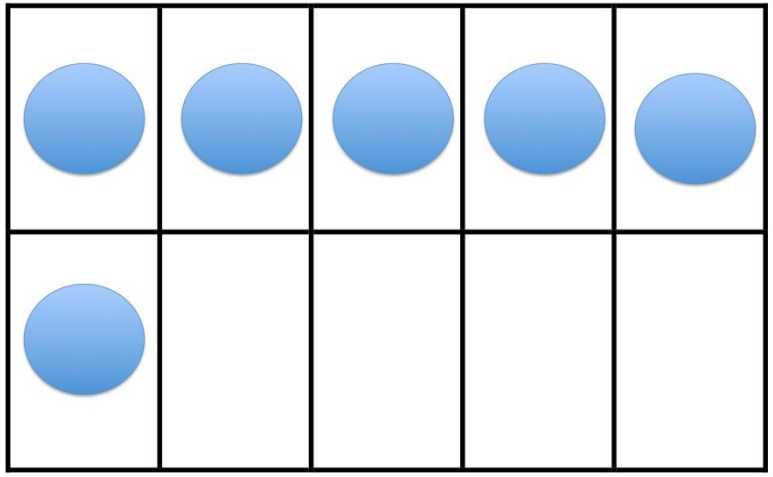
It comes after 6 and before 8.

It is fewer than 10.

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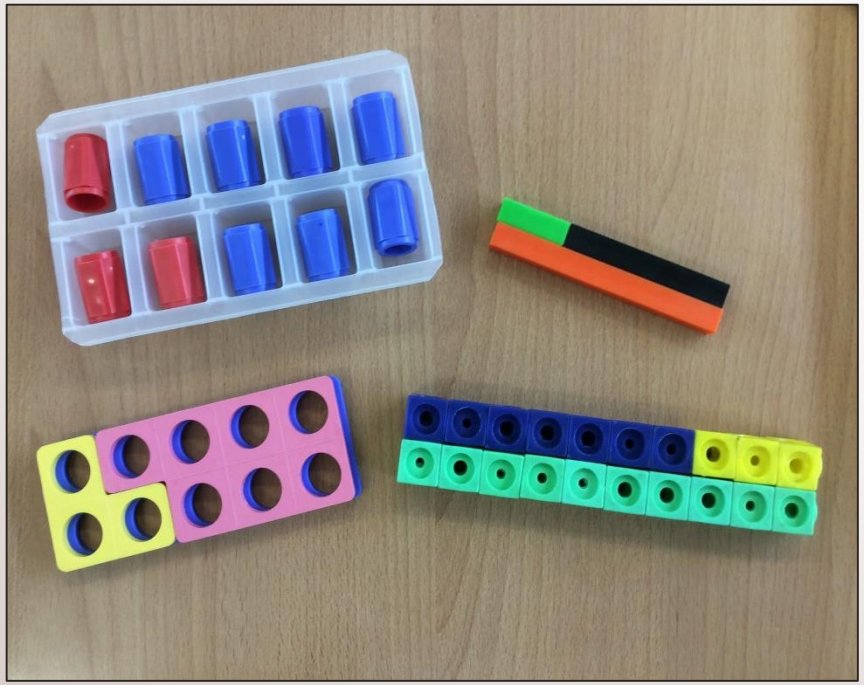
The beginning

Place one counter on 6 squares of a tens frame. Tell a friend what you see and use full sentences.



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Starting Point – concrete resources





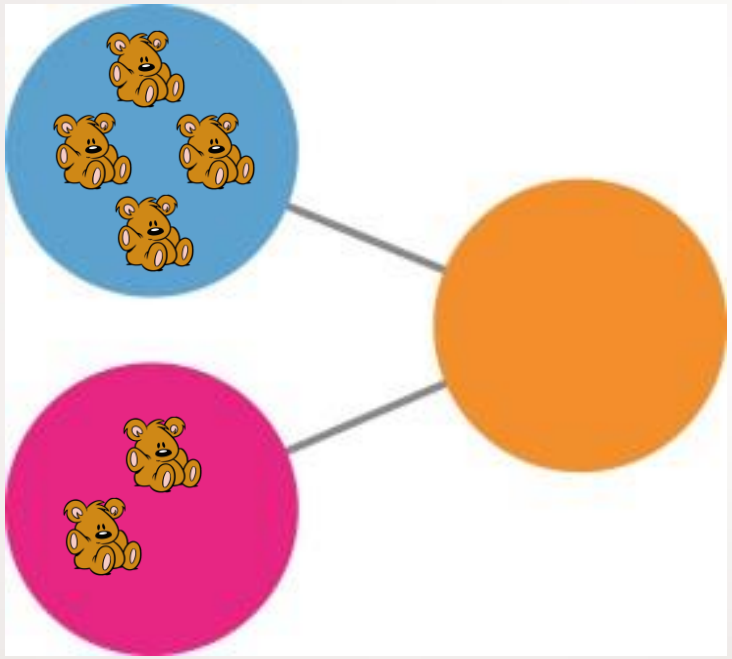
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Explore the resources!

The Part-Whole Model

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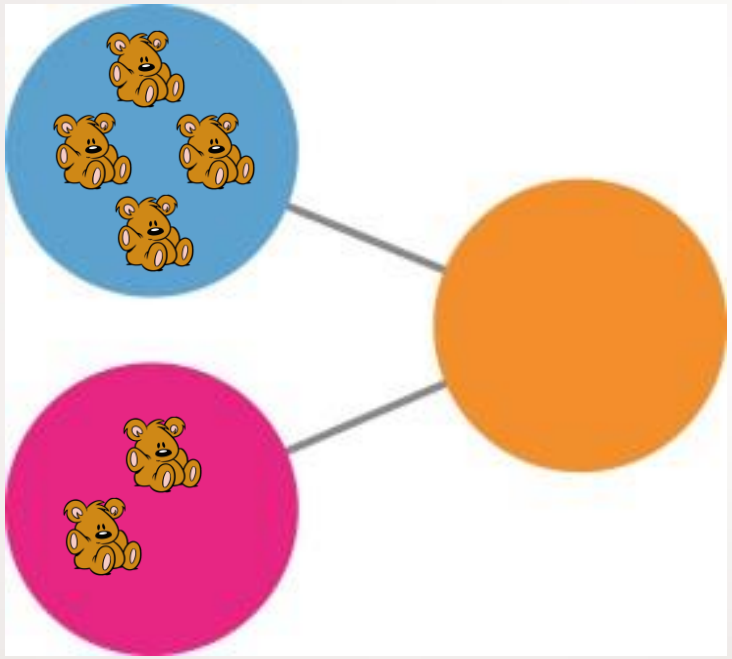
The part-whole model



Here is the part-whole model used in the mastery curriculum. It works on the principle that if you know two values out of three in a calculation, you can calculate the missing value using addition or subtraction.

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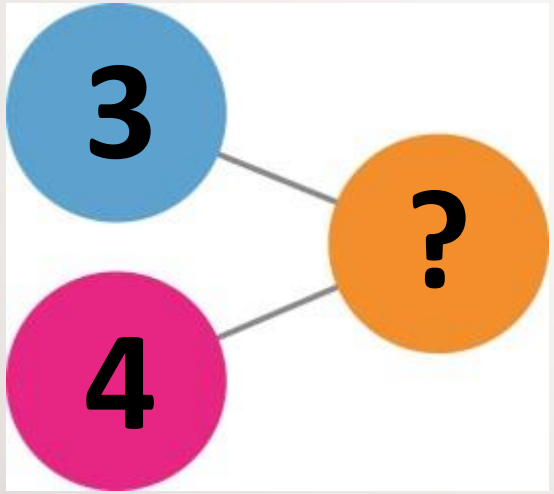
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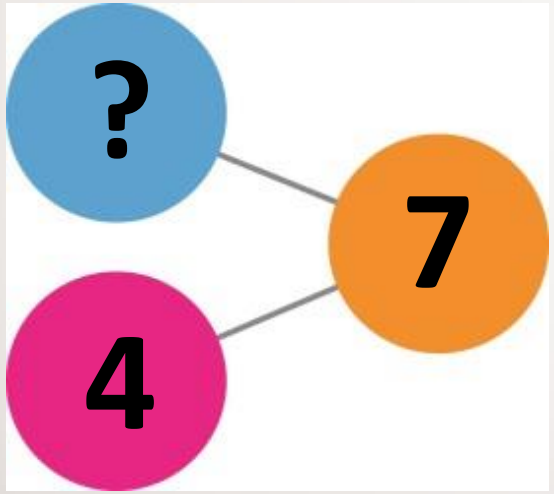
The part-whole model



The two parts (3 and 4) combine to make the whole (7).

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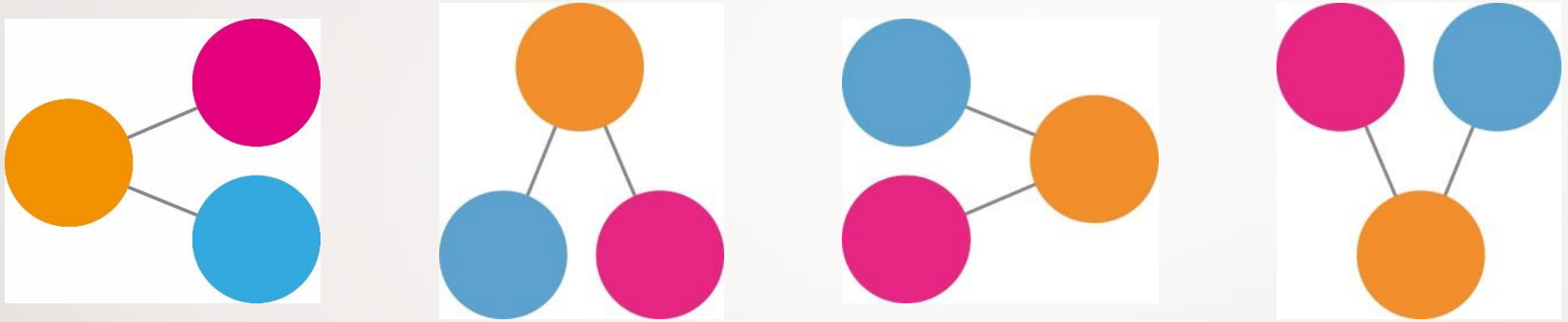
The part-whole model



We can now use the model to find the missing ‘part’

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The part-whole model

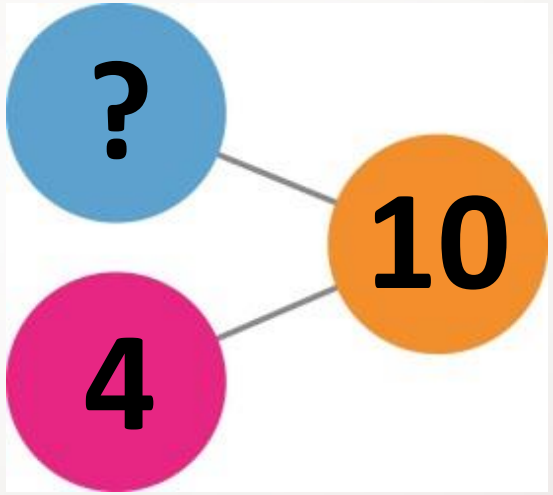


The part-whole model can be orientated differently, and is used for addition and subtraction problems

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The part-whole model

An unknown number and 4 makes 10.
This leads to a missing box calculation:



□ + 4 = 10
In other words, algebra.

The National Curriculum requires that children know their number families for all the operations, for example:

6 + 4 = 10	3 × 7 = 21
4 + 6 = 10	7 × 3 = 21
10 – 6 = 4	21 ÷ 7 = 3
10 – 4 = 6	21 ÷ 3 = 7

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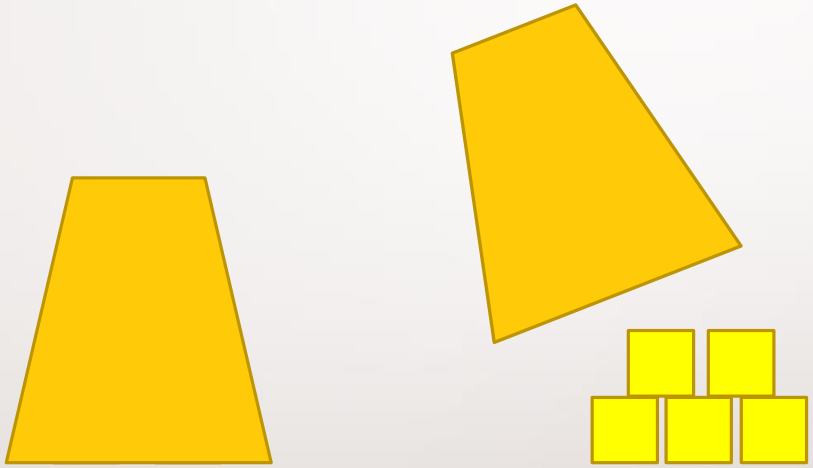
Activities and games

There are 7 cubes under the cups. You can only lift one cup up. Can you work out how many cubes are under the second cup?



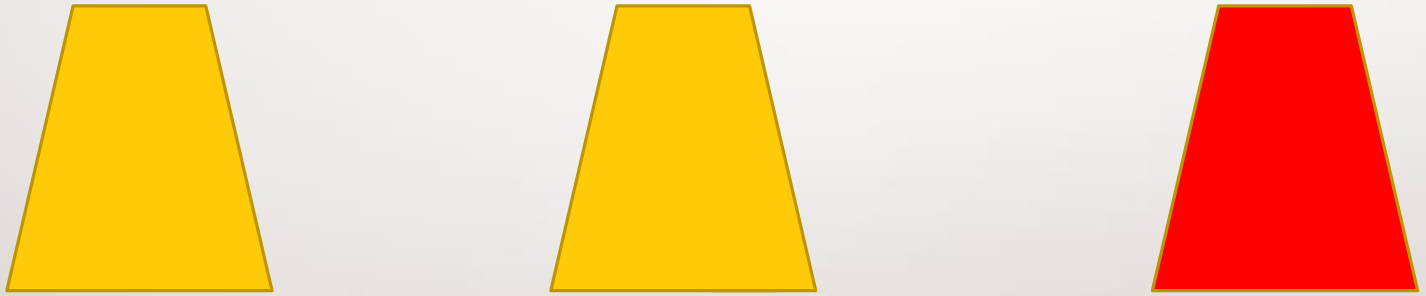
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There are 5 cubes under this cup. There are 7 cubes altogether. 7 – 5 = 2. I know that there are 2 cubes under the other cup.



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I have 3 cups and 10 cubes. I've hidden the same number of cubes under both blue cups and a different number under the red cup. You can only lift one cup.
Can you work out what is hiding under the other 2 cups without lifting them?



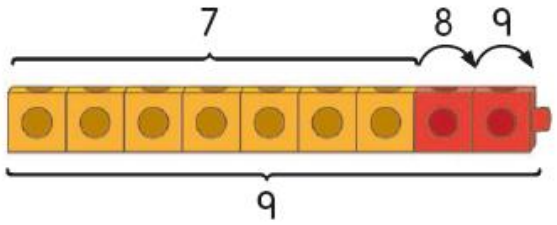
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The Bar Model

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Introducing the bar model

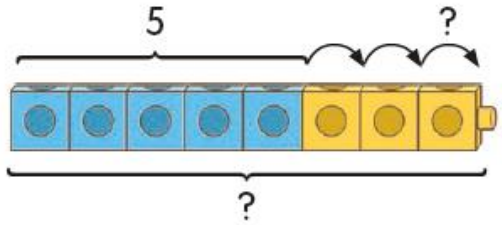
4 What is 2 more than 7?

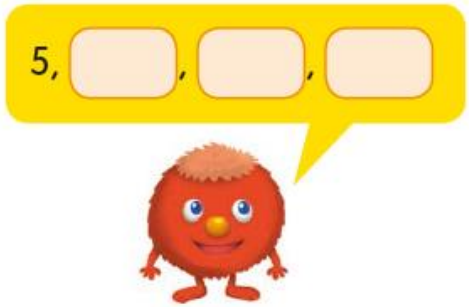




2 more than 7 is 9.

5 What is 3 more than 5?





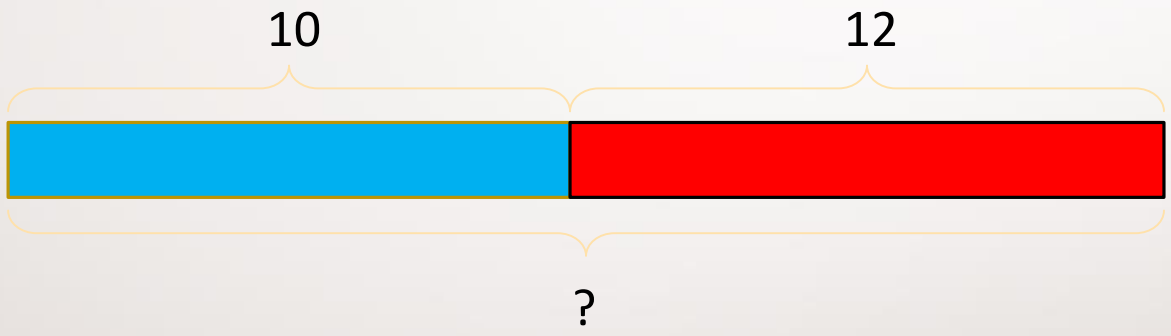
3 more than 5 is ☐.

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Introducing the bar model

Omar bakes 10 biscuits.
Ruby bakes 12 biscuits.
How many biscuits do they bake altogether?



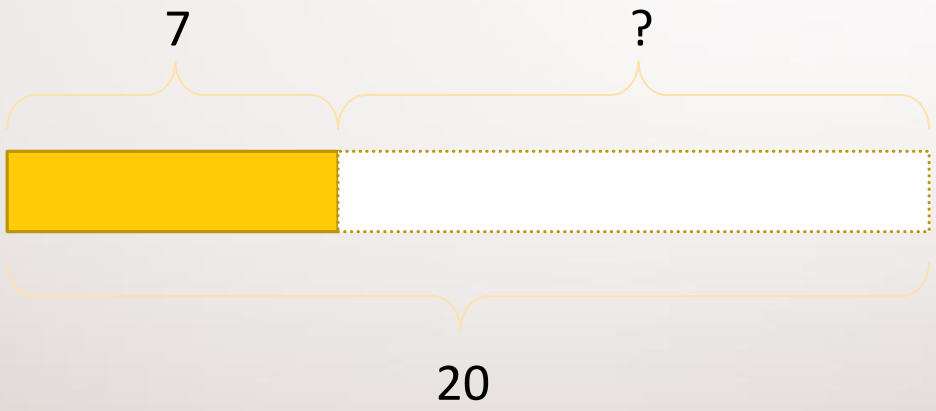
They bake 22 biscuits altogether.

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Introducing the bar model

Hardeep buys large eggs and small eggs.
Altogether he buys 20 eggs
There are 7 small eggs.
How many large eggs are there?



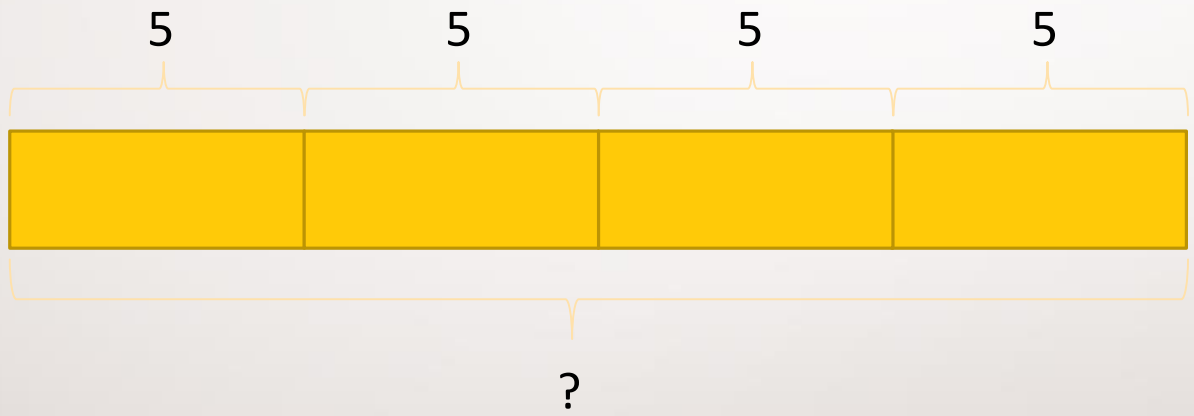
There are 13 large eggs.

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Extending the bar model to multiplication

Peter puts 5 bread rolls into each packet.
He has 4 packets.
How many bread rolls does he put into the 4 packets altogether?



There are 20 bread rolls altogether.

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Fluency

Maths fluency **allows learners to understand the relationship between numbers**. It means that not only do they get to grips with how they answer something, but they also understand *why* they've reached their answer.

e.g. knowing that 8 is made up of 5 and 3, therefore 7 is one less than 8, so is made up of 5 and 2.

How can I help my child?

- Encourage a *secure knowledge of number*, by asking questions which help them explain what comes before or after a given number, or how the number is made, for example tens and ones.
- Encourage them to *draw pictures and models* such as part-whole and bar models to answer questions.
- Support them with home activities, and encourage them to answer questions in full sentences.
- Focus on language e.g. There are 10 sweets. If there was one less sweet how many would there be? Greater, fewer, less than, most…
- Visit the Holy Trinity website for additional resources.

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How can I help my child?

You can help your child by finding and talking about maths in everyday situations. For example, a shopping trip is rich in mathematical opportunities, such as:

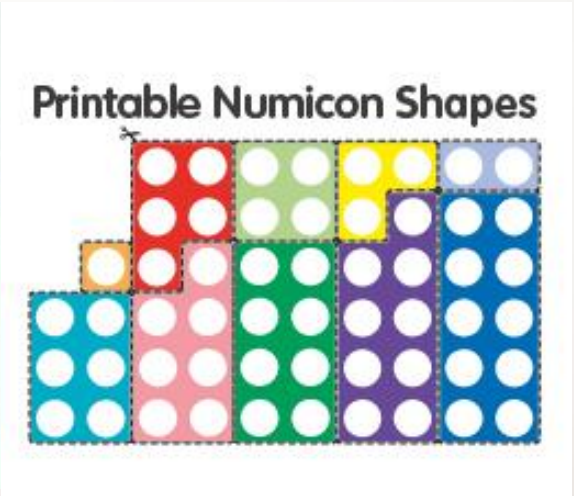
- spending money, calculating change and working out which offers give the best value for money.
- empty packaging can provide your child will immediate access to 3D shapes and nets.
- using packets and tins as a source of mathematical information to discuss, such as mass and volume.
- using items often sold in pairs, fours and sixes (such as drinks or yogurts) to talk about multiples or times tables.

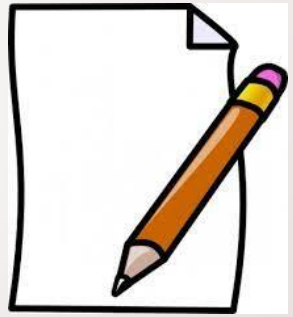
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What resources will support my child?













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