Year R - Arithmetic Expectations

This series of documents aims to summarise the number facts, mental calculation strategies and the stage(s) of the progression towards the written methods for each of the four operations.

For each strategy, the concrete and pictorial representations have been suggested. However, to keep the document to a more manageable size, the imagery has not been shown explicitly as this should be found in your school's agreed mental calculations policies.

The strategies used within this document are taken from the Lancashire Mathematics Team Progression in Mental Calculation Strategies Policies and the Progression Towards Written Methods Policies.

See www.lancsngfl.ac.uk/curriculum/primarymaths for the full policies.

Each strategy will require specific modelling (teaching) and sufficient practice for children to develop confidence, accuracy and fluency in performing them.

Children should also be taught when it is appropriate to use each strategy, by looking at the numbers involved and making effective decisions. Again, this is a sign of a child's fluency in mathematics; being able to recognise which strategy best suits a given calculation, rather than always using the same method regardless of the numbers involved.

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Arithmetic Expectations – Reception

Skills	Examples
Counting	
Count on and back within 20	Count from 0 to 10 Count back from 14 to 3 What number would come next in these counting sequences? 9, 10, 11, __ 14, 13, 12, __ What numbers come between 7 and 12?
Rote count beyond 20 and recognise the patterns in the numbers said	What number would come next in these counting sequences? 19, 20, 21, __ 24, 23, 22, __ What is the same about 16, 17, 18, 19 and 26, 27, 28, 29? What number comes after 28? What is the same and what is different? What number comes after 29? What is the same and what is different?
Number Facts	
Identify one more and one less than a given number **Identify two more and two less than a given number**	One more than 8 is___? One less than 9 is___? Use counting rhymes to illustrate one more or one less action e.g. five speckled frogs Kim is on page 6 of her book. What page will she be on next? 10 is one less than ___. One more than ___ is 12. Use same examples for two more and less.
Automatically recall addition and subtraction facts up to 5 and some addition and subtraction facts to 10	6 and 4 is __ 2 and __ is 10 10 is equal to __ and 5 10 take 3 makes __ 10 subtract __ is 1 How can you show 3 counters using red and/or yellow counters? 3 red 0 yellow or 2 red and 1 yellow or 1 red and 2 yellow or 3 yellow What patterns can you see here? What would come next? 5 is 5 and 0 5 is 4 and 1 5 is 3 and 2
Automatically recall double facts to double 5	3 and 3 is __ double 2 is ___ double ___ is 8
Mental Calculation Strategies – Addition and Subtraction	
Add by counting all *Concrete – counters, beadstring, cubes on a number track* *Pictorial – number track/line*	How many altogether when you add 4 and 5? What is 3 and 6? What is the whole if the parts are 7 and 4? What is the total when 6 and 8 are combined? There are 4 children at the painting table. 3 more join them. How many children are now at the painting table? *Strategy is to count all of the items in each group together.*
Add by counting on (chain count and link to objects, i.e. 1-1 correspondence). *Concrete – counters, beadstring, cubes on a number track* *Pictorial – number track/line*	How many altogether when you add 4 and 5? What is 3 and 6? What is the whole if the parts are 7 and 4? What is the total when 6 and 8 are combined?

	There are 4 children at the painting table. 3 more join them. How many children are now at the painting table? *Strategy is to count on from one of the numbers (the greater number would be most efficient) to find the total.*
Subtract by taking away from a group and counting how many are left *Concrete – counters, counters in a ten frame, cubes, real items*	What is 8 take away 5? How many are left when 5 is taken away from 9? What is 3 less than 11? If the whole is 8 and one part is 5, what is the other part? There are 8 children playing outside. 2 are skipping and the others are digging. How many children are digging?
Mental Calculation Strategies – Multiplication and Division	
Understand that doubling is adding the same number to itself *Concrete – real items to model the context of the problem, dominoes* *Pictorial – images of the items in the context of the problem, images of dominoes*	Show me how to find double 4 What is the same about 5 and 5 and double 5? Which of these show doubles? 2 and 2, 4 and 3, 1 and 1 How do you know? *These can be shown with dominoes.*
Share an amount into equal parts. **Understand that halving is sharing into two equal parts** *Concrete – real items to model the context of the problem* *Pictorial – images of the items in the context of the problem*	A bunch of 10 grapes are shared equally between two children? How many grapes do they each get? Four children share 8 cookies equally. How many do they each get? Show me how to find half of 6. How many equal parts should there be?
Decision Making	
When calculating, children should ask themselves: - do I know the answer because it is a fact I have learnt? - can I work it out easily in my head? - can I use some equipment or a jotting?	

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