



To face the challenges of the 21st century, each young person needs to have confidence in using mathematical skills, and Scotland needs both specialist mathematicians and a highly numerate population.

(Building the Curriculum 1, PKC Numeracy Strategy 2-18)

Numeracy & Mathematics Policy

November 2023

In Aberuthven Primary School we aim to:

Ensure all children and young people experience a numeracy rich curriculum at all stages of their primary education, led and supported by developmentally appropriate learning and teaching within a real life context for their learning where appropriate.

Planning

The Curriculum for Excellence Experiences and Outcomes in Numeracy and Mathematics are planned for in three phases; long-term, medium-term and short-term.

- The long term planning is included within the Numeracy & Mathematics Overview, collated alongside our Curriculum Map.

- The medium term planning is completed detailing Topics to be covered in Class during each School term.

- The Short term planning is completed on a weekly timetable in which they plan for a daily maths lesson.

All planned work caters for pupils in all ability groups and takes into account the targets set for individual children. Pupils within a class all experience the same aspect of Numeracy and Mathematics within a lesson. For example a whole class will be completing activities on division within a lesson.

Numeracy and Mathematics lessons are planned to include a:

Starter: Maths Talks or Mental Activity (approx. 5-10 mins)

Main: Teaching Activity (approx. 15-20 mins)

Individual/Group Work Activities (approx. 20-25 mins)

Plenary: (approx. 5-10 mins)

Accompanying daily lessons on Numeracy and Mathematics we ensure Numeracy Across Learning is planned for across the curriculum and will be included where appropriate in the planning of all subject areas. E.g. Links to Literacy- Children enjoy stories and rhyme that rely on counting and sequencing etc. This is planned for through our Curriculum Map.

Rich 'Maths Talks' Environment

Staff believe in investing time to develop confidence and understanding in the use of Mathematical Language and champion the use of technical vocabulary appropriate to each are/ topic of Maths.

(See Appendix 2)

Resources

We use a variety of resources to support the teaching and learning of Numeracy. Our core resource is Primary Maths for Scotland, alongside a variety of complimentary resources. Mental Maths is planned for using resources such as New Wave Mental Maths and Maths on Track etc. Problem Solving is taught within real-life context through a variety of resources, as well as Primary Maths for Scotland.

Pupils have the opportunity to use a wide range of active learning resources such as number lines, number squares, whiteboards, digit cards and small apparatus to support their work. Children and teachers incorporate digital learning within mathematics lessons, where it enhances learning and assists with modelling ideas and methods where possible and appropriate.

Learning at Home

Working alongside parents is an essential part of improving pupil's numeracy skills. Homework is given out weekly. The tasks issued directly link with the current unit of learning and are differentiated for each maths group.

Monitoring

There is a programme of monitoring and supporting the teaching of Numeracy and Mathematics consisting of analysis of classroom planning, observed lessons (including peer observations/ self observations) and monitoring of pupil work.

Assessment

Daily work in maths is assessed using 'Assessment is for Learning' activities including self and peer assessment, staff observations, monitoring of pupil work and 'show me' activities. Assessment check ups are used during and after Numeracy and Mathematics topics taught. Evidence and pupil work is collated in pupil jotters(P1-7) and Pupil Assessment Jotters (P4-7 only). SNSA is used to assess pupil's annual progression (P1,4,7) and are filed in Class Assessment Folder.

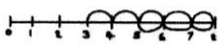
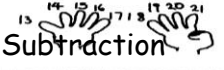
At the beginning of the maths topic in P4-7, goals are shared with pupils via 'assessment starbursts'. On completion of Topic area, pupils complete a topic 'check-up' to demonstrate their understanding of targets within the topic assessing the goals outlined at the beginning of the topic. Teachers then mark and feedback to pupils. This then helps to form a discussion between pupil and teacher around progress and targets for next time. Targets are written in Pupil Assessment Jotters.

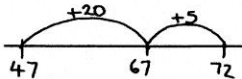
All assessments are used to help us form pupil next steps and inform our future planning.

Progression Pathway (Appendix 1)

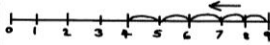
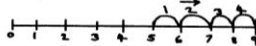
We have devised a Progression Pathway to support Teacher judgement both in planning and assessment of Numeracy. Within the pathway there is a bank of mathematical strategies which can be applied to support the solving of problems including the four main functions: addition, subtraction, multiplication and division. These strategies are taught, discussed and explored consistently across both classes. Our 'strategy pathways' are as follows:

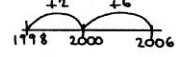
Addition

$2 + 3 =$ At a party, I eat two cakes and my friend eats three. How many cakes did we eat altogether? 	Children could draw a picture to help them work out the answer or use practical equipment to model the problem.
$6 + 5 =$ Six people are on the bus. Five more people get on at the next stop. How many people are on the bus now?  or 	Children could use dots or tally marks to represent objects.
$5 + 3 =$ What is the total of the numbers on these two dice?   $3 + 5 = 8$ $5 + 3 = 8$	Children can count along a number line, making 'jumps' to reach the answer. They can also see that the addition can be done any order, developing awareness that it is often more efficient to put the larger number first.
$12 + 9 =$ 12 birds are sitting on the grass. Nine more fly to join them. How many are there altogether?  Subtraction	Children can use their hands to calculate. Numbers greater than 10 can be worked with by holding the larger number in their hand and counting on, using fingers.

47 + 25 = My sunflower is 47cm tall. My friend's is 25cm taller. How tall is my friend's sunflower? 	Drawing an empty number line helps children to record the steps they have taken in a calculation. Start on 47, +20, +5. This is more efficient than counting on in ones. Empty number lines can be used with numbers of any size.			
87 + 64 = One shelf measures 87 cm and another shelf measures 64cm. What is their total length in cm and m? (80 + 60) + (7 + 4) 140 + 11 = 151cm or 1.51m	By partitioning (splitting) both numbers into tens and units, each part can be added separately and then the answers combined to give the total. This is the method most frequently used until at least year 5.			
487 + 546 = There 487 boys and 546 girls in a school. How many children are there altogether? <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: right; padding-right: 20px;"> $\begin{array}{r} 546 \\ 487 \\ \hline 900 \\ 120 \\ 13 \\ \hline 1033 \end{array}$ </td> <td style="width: 10%; text-align: center; vertical-align: middle;">or</td> <td style="width: 40%; text-align: right;"> $\begin{array}{r} 546 \\ 487 \\ \hline 13 \\ 120 \\ 900 \\ \hline 1033 \end{array}$ </td> </tr> </table>	$\begin{array}{r} 546 \\ 487 \\ \hline 900 \\ 120 \\ 13 \\ \hline 1033 \end{array}$	or	$\begin{array}{r} 546 \\ 487 \\ \hline 13 \\ 120 \\ 900 \\ \hline 1033 \end{array}$	Children are taught written methods for those calculations they cannot do in their heads. Expanded methods build on mental methods and make the value of the digits clear to children. The language used is very important 500 + 400, 40 + 80, 6 + 7 and then 900 + 120 + 13 OR starting with the units, tens and then hundreds. Children are taught the importance of placing digits with the same value underneath each other in clear columns.
$\begin{array}{r} 546 \\ 487 \\ \hline 900 \\ 120 \\ 13 \\ \hline 1033 \end{array}$	or	$\begin{array}{r} 546 \\ 487 \\ \hline 13 \\ 120 \\ 900 \\ \hline 1033 \end{array}$		

Subtraction

$5 - 2 =$ I had five balloons. Two burst. How many do I have left?  Take away A teddy bear costs £5 and a ball costs £2. How much more does the bear cost?  Find the difference	Drawing a picture helps children to visualise the problem. The use of practical equipment, such as bricks, helps to model the problem.
$8 - 3 =$ We baked eight biscuits. I ate three. How many were left?  Take away Lisa has eight felt tip pens and Tim has three. How many more does Lisa have?  Find the difference	Using dots or tally marks is quicker than using a picture.
$9 - 5 =$ I had nine pence. I spent five pence. How much did I have left? 	The number line is used for counting back or jumping back. The number line can also be used for counting on.  This is showing the difference

$2006 - 1998 =$ Sarah was born in 2006 and Mark in 1998. How much older is Mark than Sarah? 	Using a number line and the counting on method is particularly helpful when numbers are actually quite close to each other but cross a tens, hundreds or thousands barrier and so look harder than they actually are.
$754 - 86 =$ 754 cars were waiting to load onto the car ferry. 86 drove on. How many were still waiting? $754 = 700 + 50 + 4$ $86 = 80 + 6$ $= 700 + 40 + 14 \rightarrow 744$ $\quad \quad \quad 80 + 6 \quad \quad \quad 86$ $= 600 + 140 + 14 \rightarrow 644$ $\quad \quad \quad 80 + 6 \quad \quad \quad 86$ $\quad \quad \quad 600 + 60 + 8 \quad \quad \quad 668$	Children progress onto subtraction using decomposition - where there are fewer units, tens, hundreds etc in the larger number. The use of the expanded written method helps them understand the process and they then move onto the more compact standard written method for decomposition. Starting with the units, 4 - 6 we can't do, so we carry over a ten to make 14 units leaving 4 tens. 14 - 6 equals 8 units. Moving onto the tens column, 4 tens subtract 8 tens we can't do, so we carry over a hundred to make 14 tens leaving 6 hundreds. Now 14 tens subtract 8 tens equals 6 tens. Finally the hundreds column, 6 hundreds subtract nothing equals 6 hundreds.

Multiplication

$$5 + 5 + 5$$

$4 \times 3 =$

A chew costs two pence. How much do three chews cost?

Drawing an array (3 rows of 4 or 3 columns of 4) gives children an image of the answer. It also helps the understanding that 4×3 is the same as 3×4 .

$6 \times 4 =$

There are four cats. Each cat has six kittens. How many kittens are there altogether?

Children can count on in equal steps recording each jump on an empty number line. This shows four jumps of six.

$13 \times 7 =$

There are 13 biscuits in a packet. How many biscuits in seven packets?

When numbers get bigger, it is inefficient to do lots of smaller jumps. 13 can be partitioned (split) into 10 and 3. The calculation can be worked out on a number line or horizontally.

$13 \times 7 = (10 \times 7) + (3 \times 7)$

$= 70 + 21$

$= 91$

$6 \times 124 =$

124 books were sold. Each book cost six pounds. How much money was taken?

x	100	20	4
6	600	120	24

$$600 + 120 + 24 = 744$$

This is called the grid method. 124 is partitioned (split) into hundreds, tens and units. Each part is then multiplied by six. The answers are then added together mentally or set out vertically.

72 x 34 =

A cat is 72 cm long. A tiger is 34 times longer.
How long is the tiger?

x	70	2
30	2100	60
4	280	8

$$2100 + 60 = 2160$$

$$280 + 8 = \underline{288}$$

$$\underline{2448}$$

The grid method also works for 'long multiplication'. The numbers are partitioned (split up) and each part is multiplied separately and then each answer is added together.

The grid method can be used for numbers of any size.

28 x 7 =

In a school there were seven classes each with 28 children. How many children were in the school?

28

x 7

56 (8 x 7)

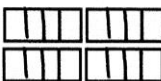
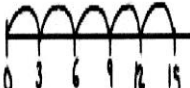
+ 140 (20 x 7)

196

From the grid method, the children begin to use more standard written methods, working vertically. Children are reminded that digits of the same value must be underneath each other.

Starting with the units, $7 \times 8 = 56$. The 6 goes in the units column and the 5 tens are carried underneath the tens column. $7 \times 20 = 140$, add the numbers together.

Division

$6 \div 2 =$ Six sweets are shared between two children. How many sweets does each child get?  <i>sharing between two</i> There are six sweets. How many children can have two each?  <i>grouping in 2's</i>	To drawing pictures make it easy for the child to visualise the problem and often makes it easier to solve. Practical equipment is also used to model and solve the problem.
$12 \div 4 =$ 12 apples are shared equally between four baskets. How many apples are in each basket?  <i>sharing between four</i>  <i>grouping in 4's</i>	Dots or tally marks can either be shared out one at a time or split up into groups. This then clearly shows how many groups or how many in each group.
$15 \div 3 =$ How many threes in 15? 3 6 9 12 15  	To work out how many threes there are, children can use their fingers to count up in groups of three. They can also draw these as jumps along a number line. This shows you need five jumps

[illegible]

