<u>Cardonald Primary School</u> <u>Numeracy and Mathematics Policy</u>



This policy has been written in line with the Curriculum for Excellence outcomes for Numeracy and Mathematics, and uses the Glasgow Counts framework to support practitioners in their planning and delivery of the mathematics curriculum.

The outcomes are to encourage greater <u>depth</u> and <u>challenge</u> for young people, to encourage learners to be <u>ambitious</u> and make learning <u>enjoyable</u>.

The policy is broken down into:

- Rational, Aims and Methodology
- Planning
- Teaching and Learning
- Classroom Environment
- Monitoring, Evaluating and Assessment



Page 1

Rational, Aims and Methodology

<u>Rational</u>

By providing a coherent, structured programme in maths with a focus on number sense, problem solving and collaborative working we will ensure that our pupils develop independence and confidence in their learning to allow them to make a positive contribution to the world around them.

"Being numerate involves developing a confidence and competence in using number that allows individuals to solve problems, interpret and analyse information, make informed decisions, function responsibly in everyday life and contribute effectively to society. It gives increased opportunities within the world of work and sets down foundations which can be built upon through life-long learning."

> Building the Curriculum 4 (LTS, 2009)

<u>Aim</u>

Numeracy is a fundamental life skill. The aim of <u>numeracy</u> is to help pupils:

• Gain a firm grounding in the core skills which permeate all areas of learning

• Develop confidence and competence in using numbers which will allow individuals to solve problems, interpret and analyse information, make informed decisions, function responsibly in every day life and contribute effectively to society.

• Enjoy maths, reducing anxiety and increasing confidence

The aim of **mathematical** education is to help pupils:

- Understand the nature and purpose of mathematics
- Study the properties, relationships and patterns in number and shape, and apply this knowledge to analyse, interpret, simplify and solve problems.
- To develop confidence in using and applying mathematics and to learn to enjoy its challenges



Page 2

<u>Planning</u>

<u>Glasgow Counts - Framework and Trackers</u>

We are using Glasgow Counts framework and trackers for planning, which have been developed in the school to include links to Heinnemann Active resources.

The Framework has been split into Trackers, with each tracker linking to a specific stage, for example 1st level tracker 1 covers p2, 1st level tracker 2 covers p3 etc. The relevant trackers should be used when planning for the children in your class.

Each topic has a resources page. We would like staff to take ownership of these pages and insert their own lesson plans, printables, links to maths resources, etc, that they have used and found successful.

It is essential that staff make themselves familiar with the framework, to enable them to plan and deliver lessons in line with this policy.

This document does not show a linear progression and **practitioners must ensure** they make explicit links across areas of learning. The following pages will give a step by step overview.

These pathways are a working document and will be updated regularly. Please be flexible in your approach and keep up-to-date with developments to ensure you can best plan for excellent learning and teaching.

The framework for Mathematics has been organised into the Curriculum Organisers in line with the CfE Experiences and Outcomes. Progression in Numeracy relies on learners developing an understanding of the intrinsic links across each of these organisers. As such, it is essential that progression within each organiser is not achieved in isolation of the others. Classroom planning should therefore focus on developing progressive learning experiences that draw from each of the organisers.

Muneracy Tracker: First Level Fact 3	Sensoria Taske, Fortune Peta	Numerory Tracker: First Level Part 3
The trackers developed for each level provide a detailed breakdown of the progressive learning intentions embedded within the framework. They aim to support practitioners track coverage through the framework and can be used in conjunction with individual schools' planning procedures.		The trackers can be navigated to via the overview page at each level and are broken down into 2 at Early Level, 3 at First Level and 3 at Second Level.

Glasgow Counts - Trackers

We use the Glasgow Counts trackers for planning (see below). Figure 2 shows HOW they should be used, as this allows for links to be made, and ensures we are revisiting all areas throughout the year. The topics being taught at the start of each planning block should be underlined on the tracker (using relevant colour) and highlighted when they have been completed for the next planning block.

Glasgow Counts – Guidance for use of Tracker



Progression is mapped from left to right acrosseach tracker. The tracker in figure 1 identifies that learning experiences have been focussed on specific organisers at different stages across the year. Such a model for planning can fail to develop a cohesive understanding of the interrelated nature of Numeracy as it can facilitate the development of gaps in understanding.

The tracker in figure 2 demonstrates that learning experiences have been planned for across all the organisers throughout the year. This facilitates the development of a coherent understanding of the links within Numeracy. As mathematical concepts get progressively more difficult, it is essential that learners are able to make these links in order to fully support the development of conceptual understanding.

We have added links to Heinemman Active resources to the existing Glasgow Counts trackers (highlighted in red, shown below), to provide more support for staff in planning and delivering high quality maths lessons.

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Estima Rour	ntion &	Estimate the answer to a problem WN 2.13	know that +/- and x/ < an inverse Operations WN 2.13	Estim solutio using the	ate and check ns to a problem inverse operatio WN 2.13	Solve probler using estimati and check usi the inverse WN 2.13	ng Justify Answers WN 2.13	Round an number to 1000 WN 2.13	Round any number to 10 000 WN 2,13	Round an number to 100 00 WN2.13	0 Round number nearest 10 000, 1 Wn2	d any to the t 1000, 100000	Round decimals to the nearest whole Number FDP 2.11	Round decimals to the nearest tenth FDP2.11
Avarentes of Number - Counting Quantites & NumberStructure	Counting	Read numbers beyond 10 000 WN 2.5a	Write numbers beyond 10 000 WN 2.5a	Count in ter thousand thousand hundreds, to and units WN2.5a	s of Order and compare s, numbers ens beyond s 10 000 WN 2.5a	Sequence numi 0-10 000 forwards an backwards WN 2.5a	d Unde	erstand and it in tenths	Understand count in hundredti	and Conve ter hs hui Fi	ert between hths and ndredths DP 2.9a	Cour for back nu	nt beyond 0 wards and kwards on a imber line WN 2.5b	Solve problems involving negative numbers WN 2.5b
	Numerals	Read and wr numbers bey 10 000 WN 2.5a	ond numberst	d compare eyond 10 00 12.5a	Describe and extend numbe sequences AT 2.6	Read and write up to 2 d FD	e decimal frac ecimal place P 2.9a	tions Orde up t	decimal fractions 2 decimal place FDP 2.10 Position decimal fractions on a number line FDP 2.11		Describe and extend number sequences involving decimal fractions with 2 decimal place			
	Quartities	Understand examples of t before and a num	and provide the numbers after a given ber	Use concre to rej differer	ncrete resources Use p represent arent numbers		Use pictorial representations to show different numbers		Match numerals to pictorial representations or concrete materials		er -	Estimate numbers using different representations		
	Place Value	To make 5 di numbers an beyond recor in numbers a words WN 2.5a	ding (beyond (conc WN	ent 6 digit bers 100 000) rrete) 2.5e	To recognise the place value of each digit in a 6 digit number WN 2.5a	Compa order num least 10 WN 2	re& berstoat 0000 .5a	To recogni descri linear nu sequen AT 2.	scribe number uences T 2.6		Represe least 2 usin hu	ent numbers to at 2 decimal places ng tenths and undredths FDP 2.9a Understand thousandths and represent the value (concrete)		
Addition & Subtraction		+ and- 4 digit numbers. and beyond (regrouping in the 1005, 105, 105 and 15 wN 2.13 WN 2.13 Use rounding to decim 2 decim 2 decim		I subtract Isubtract Isupto al places To find the missing value in addition and subtractic cal culations		i the alue in subtraction tions	To solve two step To so word problems wo for + and -		To solvem word pro for + a	Ive multistep Use a rd problems strateg or + and - + and -		variety of lies to solve - problems		
			Know prime numbers,	To solve		Divide	Multiply		To understand the distributiv	and use e law to	Divide			

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Teaching and Learning

<u>Methodology</u>

Within the teaching of maths, staff will use the Curriculum for Excellence guidelines and Glasgow Counts framework and trackers. The framework captures all elements of mathematics and breaks down each concept into a series of progressive learning intentions, informed by Education Scotland's Benchmarks.

Our methodology is in line with the key messages from Glasgow Counts:

- to use the CPA approach to develop conceptual understanding
- to develop problem solving, reasoning and fluency
- to create mathematical mindsets
- to engage in Maths Talk
- to meet the needs of all learners.

The CPA Approach



What is the CPA approach:

CPA stands for concrete, pictorial, abstract. This approach to teaching maths is based on the work of Jerome Bruner in 1980. Children's conceptual understanding of a skill will develop from being actively engaged in their learning progressing through these three stages.

Concrete: Children are introduced to a range of resources/materials such as counters, dice, shapes, straws, tens frames, base 10 materials, fraction tiles, and the list goes on. This provides them with a solid, visual aid to understanding. Using these resources pupils engage in problem solving activities, investigating and discovering. This also naturally promotes collaboration and discussion which is an element of good quality teaching and learning (Dylan Wiliams, 2008).

Pictorial: When ready, learners can progress into the pictorial phase, building on a solid foundation of active, memorable experiences and leading to a deep understanding. The bar model is an excellent way to present problems visually, improving understanding. learners can demonstrate understanding through using a variety of different pictorial models.

Abstract: When a deep conceptual understanding is demonstrated, learners may be ready to progress onto more efficient, abstract methods of working with numbers. It must be stressed not to rush too quickly through the concrete and pictorial phases of learning, as this will impede learning in the long term.

<u>Strategies</u> - children should be taught a variety of strategies to solve problems. They should understand that the same strategy doesn't work for all problems and be able to select the most effective strategy to solve each problem. This encourages ownership of their learning and allows them to achieve success. For more details of the following strategies see appendix 2.

- Partitioning
- Compensation
- Doubles/near doubles
- Arrays
- Bar modelling

- Numbered/Blank number lines
- Reordering
- Friendly 10 (besties)
- Grid Method
- To ensure children can demonstrate a solid understanding of place value, the formal algorithm (sometimes known as house/chimney sum), should only be introduced towards the end of First Level and only when the teacher feels the child has a clear understanding of WHAT they are doing and not just learning the process.
- <u>Maths Talk</u> to develop our children's problem solving, reasoning and fluency skills, to create mathematical mindsets and to meet the needs of all our learners, children must be encouraged to engage in Maths Talk. Pupils will need to build up the language of maths in oral, written and mental form, therefore, appropriate maths vocabulary should be used during teaching and learning and children should be encouraged to use this vocabulary when explaining their learning.

At Cardonald we use <u>Chat that Counts</u> to enable children to engage in discussion with their peers and have the opportunity to explain the most appropriate method or strategy to use. This helps them to make connections, and develop both their problem solving skills and the language of mathematics. 'Chat' can take place at the start of a maths lesson, but alternatively a 'Chat' session can take place at any point in the day. Chat sessions should take place every day. Number Talks-Classroom Ready book by Nancy Hughes should be used to help support meaningful discussion. See appendix 1 for Chat signals

• <u>Making Connections</u> - natural links between numeracy and maths should be planned to group topics together eg: multiplication and area. Links to other areas of the curriculum should be planned where possible eg: linking maths with other STEM subjects and topics. There should also be a greater emphasis on linking maths concepts to children's real-life experiences to ensure children understand the purpose of what they are learning and how they can use this in their everyday life.

Structure of a lesson

- Whole class mental/numeracy warm up
- Chat that counts/whole class Problem solving activity
- Teaching input
- Individual task differentiated
- Collaborative activity
- Plenary

This structure should be taught **3** days per week. Lessons can be split over the day i.e. you may decide to do your mental activity and problem solving task before break, then continue with your teaching input and tasks after break or lunch. However, with the school focus on improving maths learning outcomes, you must ensure approximately $1\frac{1}{2}$ hours is spent teaching maths 3 days per week.

Maths should be covered the other 2 days, but in a shorter format i.e. chat that counts task, problem solving (15-20 minutes)

Learning Intentions and Success Criteria.

Sharing the Learning Intentions and Success Criteria is a key approach in formative assessment. For learning to be purposeful we need to know:

- Why we are learning
- What we are learning
- How we are learning

Sharing the Learning Intentions keeps young people motivated and focused on the learning as opposed to the task or activity. Success criteria lets children and young people know exactly how their work will be assessed and ensure meaningful feedback related directly to learning. Learning Intentions and Success Criteria encourage greater independence and a sense of responsibility for learning.

Learning Intentions and Success Criteria must be explicit and must be referred to throughout the lesson. It is expected that a grid is used at the start of a <u>block</u> of learning detailing the Learning Intentions and Success Criteria and this should be teacher/self/peer assessed once the block of learning has been completed.

Presentation of Work

Work should be presented in line with the schools' Presentation Policy. Children in P2-P7 should complete at least 1 piece of written work in their jotter every week.

Weekly Organiser - example

Monday	Tuesday	Wednesday	Thursday	Friday
Mental/numerac	Mental/numerac	Mental/numer	Mental/numera	Mental/numera
y warm up	y warm up	acy warm up	cy warm up	cy warm up
Chat that	Chat that	Chat that	Chat that	Chat that
counts/Problem	counts/Problem	counts/Proble	counts/Problem	counts/Problem
solving tasks	solving tasks	m solving	solving tasks	solving tasks
		tasks		
Teaching Input		Teaching	Teaching Input	
		Input		
Individual task		Individual	Individual task	
		task		
Collaborative		Collaborative	Collaborative	
Activity		Activity	Activity	
Plenary		Plenary	Plenary	

Termly Organiser - Pace of Learning

A Pace of Learning progression planner should be completed every term. Areas to include:

- Weekly teaching focus
- Assessment focus
- Times tables/Warm up
- IDL

This document should be added to Forward Plan

Yearly Organiser - example

Daily	Weekly	Termly
Number sequences	Numeracy	Time
Chat/Problem solving	Money	Shape/Position/Mment
Collaborative activity	Data Handling	Measure

To ensure we are revisiting all areas throughout the year, areas such as money, time, measure etc could be incorporated into chats/problem solving tasks at the start of the lesson. They can also be included in activities being covered during collaborative tasks i.e. a money station, or time station during an addition lesson.

Classroom Environment

Classroom Organisation

A maths area should be created within your classroom to allow children easy access to relevant resources (see core resources below). This will have the dual effect of both encouraging children to use concrete resources whilst removing the stigma sometimes associated with concrete resources. Children should be familiar with routines for collecting and returning materials.

Further maths resources (shape, time, money, weight etc etc) are available in the maths room 9.

Visual displays appropriate to stage, should be displayed around the classroom to support learners, with an emphasis on maths vocabulary.

Resources -

Core Resources:

- Whiterose Maths all staff have access to Whiterose online premium resources. As it complements the Glasgow Counts methodology and CPA approach, this should be the main maths resource used. It is designed around the English curriculum therefor P1 is the equivalent to reception, P2 to Yr1 etc. Main features
 - Schemes of learning for each maths area (i.e. place value, addition subtraction etc for each year group). V3 is the most up to date version. It includes teaching slides (powerpoint), video link (upskill teacher), worksheet that can be downloaded or used on ipads, answer sheet.
 - Downloadable scheme of learning (this is the teacher notes)
 - End of block assessment
 - Resources for composite classes i.e. yr 1/2 (equivalent to P2/3, updated version available 24/25)
 - Fluency Bee (Yr1-Yr4). Although this is used for learning support, the PowerPoints can be used as warm-ups/chats at the start of a lesson.
- Heinemann Active Maths numeracy folders covering all numeracy experiences and outcomes, teaching notes and game boards are printed and available for each stage (p2 and p5 are green, p3 and p6 are orange, p4 and p7 are purple). All HAM resources are also available online on Our Establishment Online. There is also an easy to follow guide.
- 3. Glasgow Counts Framework available on Our Establishment
- Maths box at the start of the year, each class will be supplied with a maths box with resources relevant to their stage (i.e. dice, 100 squares, fraction tiles, deines materials, spinners, place value, counters etc).

- Online Resources there is a <u>vast</u> array of online and printable material and website details available on the Maths Resources folder on Our Establishment. It is highly recommended that staff spend time at the start of the school year accessing this to see what materials are available. Collegiate working is a key component of effective teaching and learning and staff are encouraged to add to this folder to share any good resources they find.
- Baseline Assessment Results you can find the results from the last baseline assessment of all pupils in the Maths and Numeracy folder, under Assessment. This should be used to help you identify the needs of the children in your class, and to plug any gaps in their learning.
- Text books Heinemann Active Maths books, TJ, Leckie and Leckie
- Whiteboards, pens, clear wallets (all of these resources encourage collaborative learning)
- Core resources the following resources should be available at ALL times in ALL stages; number lines (varying number increments), 100 squares, multiplication squares, counters/cubes, rulers, whiteboards, pens, clear wallets, deines materials, place value counters/boards. These resources will support collaborative, active learning in line with the CPA method.

Monitoring, Evaluating and Assessment

Monitoring and Evaluating

Each class teacher is responsible for monitoring and evaluating the work of their children to ensure their learning needs are being met and the pace of work is appropriate. The Leadership Team also has a responsibility to monitor teaching and learning within the school as part of the Quality Improvement calendar. Forward Planning will be reviewed and learning will be discussed at tracking meetings - 4 times throughout the year.

Assessment

Assessment is an on-going process which happens on a regular basis, and a variety of methods should be used to assess progress, including summative and formative assessment and teachers' professional judgement.

SNSA (P1, P4, P7) are used for assessment purposes at different periods of the school year. They measure progress made and identify areas of need which allow SLT and teaching staff to target support appropriately.

Baseline assessments (either SNSA's or another summative assessment) for each class will be available at the start of the school year and should be used to identify gaps in learning across the year group and targeted children. This should then inform planning and learning support.

Term 1	Term 2	Term 3	Term 4			
Outcome(s) from Outcome(s) from		Outcome(s) from	Outcome(s) from			
Awareness of Awareness of		Awareness of	Awareness of			
number <mark>*</mark>	number	number	number			
Outcome(s) from	Outcome(s) from	Outcome(s) from	Outcome(s) from			
<mark>either</mark> FDP, DH,	<mark>either</mark> FDP, DH,	<mark>either</mark> FDP, DH,	<mark>either</mark> FDP, DH,			
A&S, M&D	A&S, M&D	A&S, M&D	A&S, M&D			

Two periodic assessments should be undertaken every term:

*Awareness of number examples include; place value, counting, numerals, quantities

Assessment grids should be completed and added to Forward Plans for each child in your class.

Assessment Resources:

- Whiterose end of block assessment
- Heinemann Active Maths assessment
- Heinemann/TJ Check-ups
- See/Make/Do assessment linked to a context or topic

<u>Homework</u>

Maths homework grids should be used each term. They can be amended to include specific areas you will be covering each term. They should also include whichever strategies you are focussing on, and whichever times tables or number bonds should be practised.

Staff consultation on Policy: April 2019 Final Draft: June 2019 Policy reviewed date: 26th June 2024



Appendix 1 - Chat the Counts signals

Appendix 2 - Strategies

These cards can be used to support learning for example you may want to have them in homework jotters to help clarify strategies for parents.

(see Strategies folder, Support Cards, in the Maths and Numeracy folder, on the shared area)

Click here for Glasgow Counts Strategies