Fluency in Mathematics Policy

September 2019

Education is not the learning of facts, but the training of the mind to think.

Albert Einstein

RATIONALE:

One of the three aims of the 2014 curriculum states that pupils will: *become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.*

At Holywell First School we recognise that basic skills in mathematics are the building blocks which allow the children to become fluent, confident and accurate mathematicians. Without these skills children cannot solve problems and reason mathematically.

AIMS:

- To allow children to become fluent in the fundamentals of maths so that they are able to recall and apply their knowledge rapidly and accurately to solve problems.
- To provide a consistent and progressive framework across school in the teaching of fluency of skills.
- To foster effective learning in basic skills in mathematics by suggesting appropriate ways of teaching these skills.
- To meet the requirements of the 2014 Primary National Curriculum

TEACHING AND LEARNING:

At Holywell First School children are offered the following opportunities to rehearse, recall and practice their basic skills in mathematics:

* Daily Hi 5 Maths session, either before or away from the mathematics lesson which focuses on five key skills. See Appendix 2 for structure of the session.

* Displays in the classroom and around school which promote basic skills.

BASIC SKILLS PLANNING:

Planning of activities to develop children's basic skills and fluency is taken from the Primary National Curriculum 2014. This is mapped out to show progression and to ensure that all areas are covered thoroughly, ensuring that no gaps in children's knowledge appear. See Appendix 1

The expectations are that the majority of children will move through the stages at broadly the same pace. However, decisions about when to progress to the next stage will be taken by the class teacher and will be based on the pupils' security in understanding and application of the skills. Pupils who grasp and apply skills quickly should be challenged by moving to the next level. Those who are not sufficiently secure should be provided with opportunities to consolidate and master their understanding.

RESOURCES:

At Holywell we have a range of resources to support children in becoming fluent in basic skills.

Across all phases of children's learning a range of practical equipment is used to secure children's conceptual understanding including Numicon, dienes, place value counters and real life objects.

ASSESSMENT:

The school uses 'Small Steps' assessment for mathematics and staff indicate whether a child is working towards the expected standard, at the expected standard or greater depth for each small step within the unit of work. Staff use prior learning, teacher knowledge and pre-assessment information to identify any areas of development and plan accordingly. At the end of each mathematics unit, the teacher indicates if each child is working towards the expected standard, at the expected standard or greater depth. This data is collected in by the SLT (Maths coordinator) and children who have not yet made the expected progress, or children who are working behind the expectations for their year group are identified. Pupil Progress meetings are then held to review the successes of the term, and to identify next steps for those vulnerable children identified. The information from these meetings is used to plan, support timetables and further CPD for staff. The data analysis is supported by lesson observations, planning and book scrutinies which are carried out termly.

Alongside the class teacher's assessment for learning, children complete a mental maths test and this information feeds into the foci for the Hi 5 sessions.

MONITORING:

The monitoring of the teaching and learning of basic skills will be carried out by the school's senior leadership team and will involve:

- Hi 5 maths observations (as part of the monitoring and evaluation of maths)
- Analysis of data
- Pupil progress meetings
- Work scrutiny
- Pupil interviews

Any CPD requirements will be identified as part of the monitoring process and staff will be signposted to the relevant CPD either internal or external.

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Adopted: Autumn 2019

Review date: Spring 2021

Chair of Strategic Policy and Direction Committee: _____

Appendix 1: Progression in fluency of skills

Year	Counting	Place Value	Addition and Subtraction	Multiplication and Division	Time	Fractions
1	Count forwards and backwards from any given number up to 100. 1 more/less than any number to 100	Read and write numbers to 20 in numerals and words. Read numbers to 100 in numerals Compare and order numbers to 100. Begin to recognise place value in two digit numbers.	Recall number bonds to 20 and related subtraction facts. Add & subtract 1 digit & 2 digit numbers to 20, including zero.	Count in steps of 2,5 and 10 Solve one-step multiplication and division using objects, pictorial representation and arrays.	Sequence events in chronological order. Use language of day, week, month and year. Tell time to hour & half past.	To recognise and find ½ and ¼ of an object, shape or quantity.
2	Count forwards and backwards in steps of 2, 3 and 5 from 0 and in tens from any number. Count in halves and quarters to 10.	Compare and order numbers up to 100 and use < > =. Read and write all numbers to 100 in digits & words. Say 10 more/less than any number to 100. Recognise place value of any two digit number. Partition a number in different ways e.g. 46 = 4tens and 6 ones or 3 tens and 16 ones	Have a fluent recall of number bonds of all numbers to to 20 and related subtraction facts. Use number bonds to 10 to derive facts to 100 (10+90 = 100) Add & subtract: 2-digit nos & ones 2-digit nos & tens Two 2-digit nos Three 1-digit nos Recognise and use inverse (+/-).	Count in steps of 2, 3 & 5 from zero and in 10s from any number (forwards and backwards). Recall and use multiplication & division facts for 2, 5 & 10 tables. Calculate and write multiplication & division calculations using multiplication tables.	Tell and write the time to 5 minutes including quarter past/to the hour on an analogue clock.	To recognise, find, name and write fractions ¼, 1/3, 2/4, ¾ of a length, shape, set of objects or quantity. Write simple fractions of amounts e.g. 12 of 6 = 3 Write and recognise equivalence of simple fractions
3	Count forwards and backwards from 0 in multiples of 4, 8, 50 and 100. Count up and down in tenths counting beyond 1	Recognise the place value of each digit in a three digit number. Compare and order numbers up to 1000. Read & write all numbers to 1000 in digits and words. Find 10 or 100 more/less than a given number. Partition a 3 digit number in different ways e.g. 146 = 1hundred, 4tens and 6 ones or 1 hundred, 3 tens and 16 ones	Recall number bonds to 100 (36 + 64). Add and subtract: 3-digit nos and ones 3-digit nos and tens 3-digit nos and hundreds Add and subtract numbers with up to 3-digits using written columnar method. Estimate and use inverse to check.	Recall multiplication and division facts for 2,3,4,5 ,8 and 10 tables up to x 12. Multiply 2-digit by 1-digit (formal method) Estimate and use inverse to check.	Tell time using 12 and 24 hour clocks; and using Roman numerals. Tell time to nearest minute. Know the number of seconds in a minute and the number of days in each month, year and leap year.	Identify, name and write unit fractions up to 1/12. Recognise fractions which are equivalent to 1 whole and pairs which add up to 1 whole. Compare and order fractions with same denominator. Add and subtract fractions with same denominator with whole.
4	Count forwards and backwards in multiples of 6, 7, 9, 25 and 1000. Count backwards through 0 to include negative numbers. Count up and down in hundredths	Recognise the place value of each digit in a four digit number. Recognise the place value of digits in decimal numbers up to hundredths. Read Roman numerals to 100. Compare and order numbers beyond 1,000. Compare and order numbers with up to 2 decimal places. Find 1,000 more/less than a given number. Round any number to the nearest 10, 100 or 1,000. Round decimals with 1dp to nearest whole number.	Recall number bonds to 100 (36 + 64) and their related subtraction facts. Add and subtract numbers with up to 4-digits using written columnar method. Estimate and use inverse to check.	Recall multiplication and division facts for all multiplication tables up to 12 x 12 Multiply: 2-digit by 1-digit 3-digit by 1-digit Estimate and use inverse to check.	Read, write and convert time between analogue and digital, 12 and 24 hour clocks. Convert from hours to minutes; minutes to seconds; years to months; weeks to days.	Recognise and write decimal equivalents of any number of tenths or hundredths e.g 3/10 = 0.3, 35/100 = 0.35 Recognise and write decimal equivalents to ¼, ½, ¾ Recognise and show families of common equivalent fractions.

Appendix 2: Structure of a Hi 5 session

Each Hi 5 Maths session lasts for approximately 20 to 25 minutes and focusses on the practise of 5 basic skills per session. The session is quick paced and interactive

Teachers organise the class how they wish for the session, some use the carpet others have their class sitting at tables. When recording is needed, the children record in their 'Have a go books' or whiteboards.

All children should be actively involved in a session and included through differentiated questioning, challenge tasks, choice of entry points to tasks and through support.

The session is structured around a series of 5 slides on the Interactive Whiteboard which is used to display resources to support the children in their mental strategies and conceptual understanding (100 squares and number lines for counting, calendars etc) though some of these activities may be based around playing a game which doesn't involve the whiteboard

Each session must include:

- 1) A counting activity where the children count forwards/backwards in steps appropriate to their year group (see progression in fluency of skills document Appendix 1).
- 2) Measurement work where children practise skills such as time, length, capacity, weight etc.
- 3) A problem which has more than one step needed to solve it. These can be based around images or taken from exemplar materials.
- 4) Times table focus (Focus on the quick recall of multiplication and division facts for a times table aswell as quick recall of the facts.
- 5) Pre-teaching. The teacher will identify concepts which are due to be taught in the next few weeks and plan a series of sessions which go over the basics and previous knowledge.

<u>Ideas of games/activities that can be used during H15</u>

- A mad minute where children have one minute to record as many pairs of number bonds to X as they can, to calculate missing numbers in calculations, find as many totals from a number of coins, read as many times on clocks, add/subtract 10 minutes from a time on clocks.
- Odd One Out – from a selection of numbers, shapes, coins, measures etc children have to explain which is the odd one out and why.
- Sometimes, Always, Never- children are given a statement which they then have to explain if it is sometimes, always or never true e.g. *every multiple of 4 ends in 4, 6 or 8.*
- Images: a range of images are used to encourage children to identify shapes, lines of symmetry, estimate, order, count, memorise. They can also be used as stimulus for word problems, or to pose questions such as Where is the Maths in that?
- Opinion line: Children are given a statement and have to place themselves along a continuum to show if they agree or disagree.